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Research on Improving the Quality of Employment Guidance in Local Universities through Artificial Intelligence

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Abstract: With the continuous increase in the number of university graduates and the intensification of structural contradictions in the job market, employment guidance in local universities faces significant challenges. Based on the theory of digital transformation in education and the application framework of artificial intelligence (AI), this paper explores pathways for AI to enhance the quality of employment guidance in local universities, using employment data of university graduates in Sichuan Province and relevant policy orientations. Through case analysis, survey data, and theoretical research, the study finds that AI can optimize employment guidance processes and improve job-person matching efficiency through intelligent matching, personalized recommendations, and data-driven decision-making mechanisms, thereby facilitating the alignment between talent cultivation in universities and industry demands. The study proposes the construction of an "AI + Employment" ecosystem, the refinement of intelligent evaluation models, and the deepening of university-enterprise collaboration, providing theoretical foundations and practical references for the reform of local university employment guidance systems.

Keywords: Artificial intelligence; Local universities; Employment guidance; Digital transformation; Job-person matching

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1. Introduction

In recent years, the number of university graduates in China has continued to grow, reaching 11.79 million in the 2024 cohort, further exacerbating employment pressure [1]. Meanwhile, the digital economy and industrial upgrading have created a large number of emerging job opportunities, yet the structural mismatch between university talent cultivation and market demands remains prominent. As the primary suppliers of regional talent, local universities play a crucial role in shaping the employment competitiveness of graduates. However, traditional employment guidance models exhibit significant shortcomings in information processing efficiency, personalized services, and data-driven decision-making, necessitating breakthroughs

through technological innovation. Artificial intelligence (AI), with its powerful capabilities in data analysis, pattern recognition, and automated decision-making, offers new perspectives for employment guidance. Taking local universities in Sichuan Province as the research focus, this paper explores the theoretical logic and practical pathways for AI to enhance employment guidance quality, considering policy contexts and practical case studies.

2. The value implication of AI-enabled employment guidance in local universities

2.1. Ideological characteristics of contemporary college students

According to the *52nd Statistical Report on China's Internet Development* released by the China Internet Network Information Center (CNNIC), as of December 2023, the number of internet users in China had reached 1.092 billion, an increase of 24.80 million compared to June 2023. The internet penetration rate stood at 77.5%, increasing 1.1 percentage from June 2022. In terms of channels of accessing internet, the number of mobile internet users reached 1.108 billion, with 99.8% of internet users accessing the internet via mobile devices, and the percentage of internet use reached 78.6%.

As members of Generation Z, contemporary college students have grown up in the digital age as "digital natives." Their way of thinking, learning habits, lifestyle, and entertainment preferences all reflect the characteristics of the "mobile internet generation." According to incomplete statistics, college students constitute the main force of internet users, occupying the largest proportion in the occupational structure of internet users. They are characterized by active thinking, independence, openness, and strong self-learning abilities. They frequently browse news, engage with social media platforms like Weibo, and watch short videos on platforms such as Douyin and Kuaishou. They are highly receptive to new information, and their thoughts and behaviors are deeply influenced by the internet. Embedded digital habits, strong individual consciousness, and diversified value orientations are the most prominent ideological characteristics of Generation Z college students.

In terms of employment, these traits manifest in several ways. Some Generation Z college students prefer exploring new things online but show little interest in offline activities. Some exhibit a "lying flat" or "Buddhist" mindset, lacking the initiative to explore career opportunities or plan their career paths in advance. When job hunting, many struggle due to unclear self-positioning and mismatched skills, leading to challenges such as "lazy employment" and "delayed employment." These factors ultimately affect the overall quality of employment among college graduates.

2.2. AI development accelerates the transformation of employment services

The Third Plenary Session of the 20th Central Committee of the Communist Party of China proposed the goal of "establishing a sound mechanism for promoting high-quality and sufficient employment." This objective reflects the Party and the nation's strong emphasis on employment. High-quality and sufficient employment not only entails an increase in job opportunities but also an improvement in employment quality, including job stability, salary levels, and career development prospects. To achieve this goal, a series of policy measures must be implemented to ensure the healthy development of the job market.

The *14th Five-Year Plan for Employment Promotion* issued by the State Council explicitly calls for "promoting the digital and intelligent transformation of employment services." With the rapid development of the digital economy, digitalization and intelligence have become major trends in employment services. Advancing the digital and intelligent transformation of employment services can enhance efficiency and

quality, providing job seekers and recruiting enterprises with more convenient and effective services. It also put forward the proposed *The Construction of an Intelligent Employment Service Platform*, aiming to further implement the action of "using data to empower the cloud," promote the digital transformation and empowerment of traditional offline business forms, and create more job opportunities in the digital economy, thereby offering better employment services to university graduates and enterprises.

3. Theoretical basis

The renewal of educational philosophy in the digital transformation of education mainly refers to the comprehensive integration of digital technology into the field of education to achieve precise and personalized services. In today's digital era, the rapid development of digital technology has brought profound changes to the education sector. According to the theory of digital transformation in education, traditional education models can no longer meet students' diverse learning needs or the demands of society for talent. Therefore, it is necessary to comprehensively restructure educational processes using digital technology. Through digital teaching platforms, online educational resources, and intelligent teaching tools, it is possible to achieve personalized content delivery, real-time monitoring and evaluation of learning progress, and optimized allocation of teaching resources, thereby improving the quality and efficiency of education.

The concept of intelligent matching is based on big data and algorithms to optimize the efficiency of information matching between suppliers and demand sources. In the job market, a large number of job seekers and recruiting companies face severe information asymmetry, which significantly impacts employment efficiency. Intelligent matching theory utilizes big data technology to collect and analyze relevant information from both job seekers and employers, including job seekers' personal details, academic performance, career preferences, and work experience, as well as employers' job requirements, company size, and industry characteristics. By applying algorithmic models to match and analyze this information, the theory identifies the most suitable job seekers for specific positions, thereby enhancing the efficiency and accuracy of job matching.

Career construction theory advocates for dynamically adjusting career planning, aligning with AI technology's capability to track and provide feedback on students' career development [2]. Career construction theory posits that career development is a continuous process of change and adjustment, influenced by various factors such as personal interests, abilities, values, and social environments. Consequently, career planning should also be dynamic and flexible, requiring timely adjustments based on individual development and changes in the social environment. AI technology can facilitate dynamic tracking and feedback on students' career development by collecting data on their academic performance, internship experiences, and career preferences. Through analyzing students' career trajectories and potential, AI can provide personalized career planning advice and guidance. These theories provide a solid theoretical foundation for AI-driven career guidance in local universities, ensuring that AI applications in employment counseling are theoretically grounded and justified.

4. Analysis of the current status and issues of employment guidance in local universities

Based on survey data from 647,000 graduates of the 2024 cohort in Sichuan Province [3], there are several issues in career guidance at local universities.

4.1. Low efficiency in matching supply and demand for employment

From the perspective of graduates, 22.21% of graduates prefer careers in the education sector (*Report on Students' Source Information and Employment Intention of 2024 College Graduates in Sichuan Province*), while there is a 30-million job gap in the digital economy sector (*Industrial Digital Talent Research and Development Report 2023*) [4], indicating a strong concentration of employment preferences. This phenomenon reflects graduates' relatively traditional career outlook and limited awareness of emerging industries and job opportunities. The education sector has long been considered a stable and respectable career choice, making it highly attractive to graduates. However, as the digital economy rapidly expands, competition in the education job market has intensified, while demand in the digital economy sector remains unmet.

On the employer side, there is a disconnect between corporate hiring needs and graduates' skill profiles, leading to low efficiency in supply-demand matching. Corporate hiring needs continuously evolve with market demand and business strategies, causing shifts in required skills. However, career guidance departments at local universities often fail to update their understanding of the latest job market trends or dynamically adjust graduates' competency profiles. This mismatch between employer expectations and graduates' abilities negatively impacts employment efficiency.

4.2. Insufficient precision in guidance services

On one hand, 73.5% of students believe career guidance courses are "outdated and lack relevance," indicating an issue of content homogenization. Traditional career guidance courses typically use standardized materials and teaching methods, neglecting students' individualized career development needs. The course content mainly focuses on employment policies and job-seeking skills, with insufficient coverage of emerging industries and job market analysis, making it difficult to meet students' actual needs.

On the other hand, employment information platforms are not integrated with talent development data, leading to a job recommendation accuracy rate of less than 40%. The fragmentation of resources negatively affects the precision of career guidance services. Employment information platforms serve as crucial channels for local universities to provide job placement services, but many of these platforms operate independently from student academic and skills data, preventing effective data sharing and integration. As a result, these platforms fail to recommend suitable job opportunities based on students' academic performance, professional skills, and career preferences, undermining the effectiveness of career guidance.

4.3. Weak data-driven capabilities

Traditional assessment methods primarily rely on subjective questionnaires and expert interviews, making it difficult to track students' skill development and employer demand fluctuations in real time. The lack of data-driven capabilities limits the effectiveness of career guidance. While subjective surveys and expert interviews can provide some insights, they suffer from strong subjectivity, small sample sizes, and poor timeliness. Given the rapidly changing job market and diverse student needs, traditional evaluation methods no longer meet the demands of modern career guidance. A data-driven approach to career guidance can analyze and mine large employment datasets, enabling real-time tracking of students' skills and employer demand shifts. This provides scientific insights and decision-making support for career guidance. However, local universities still face significant challenges in data collection, analysis, and application, resulting in weak data-driven capabilities that limit the effectiveness and quality of career guidance services.

5. Practical paths for AI-enabled employment guidance

5.1. Construction of an intelligent matching system

The first step is data integration, which involves aggregating students' academic performance, internship experience, and career preferences to construct a "Student Competency Profile." Academic performance reflects students' mastery of professional knowledge, internship experience demonstrates their practical skills and professional qualities, and career preferences indicate their interests and inclinations toward different professions. By integrating these data points, a comprehensive and accurate understanding of students' abilities and characteristics can be achieved, providing fundamental data for intelligent matching.

For example, a polytechnic university in Sichuan Province has established an "AI Employment Data Center," integrating data from the university's academic system and the [24365] platform, which has increased the matching accuracy to 68%. The AI Employment Data Center enables centralized management and sharing of student information by combining data from internal academic systems and the [24365] platform. Meanwhile, AI technology is employed to analyze and mine these data, constructing a "Student Competency Profile" that is precisely matched with enterprise job requirements, significantly improving matching accuracy.

The second aspect is algorithm optimization, utilizing collaborative filtering algorithms and natural language processing (NLP) technology to achieve precise matching between job requirements and student profiles. Collaborative filtering is a recommendation algorithm based on user behavior data, which analyzes historical behaviors and preferences to suggest similar items or services. In employment guidance, collaborative filtering algorithms can analyze students' job search history and career preferences to recommend similar job positions. NLP technology, on the other hand, can perform semantic analysis on companies' job postings and students' résumés, extracting key information to achieve accurate matching between job requirements and student profiles.

5.2. Personalized career development support

The first component is intelligent assessment and feedback. For instance, an agricultural university in Sichuan Province has implemented an AI career assessment system that utilizes machine learning to analyze students' personalities and career inclinations, with a customized recommendation adoption rate reaching 82%. The AI career assessment system employs machine learning algorithms to comprehensively evaluate students' personality traits, interests, and competencies, analyzing their career tendencies and potential. Based on the assessment results, personalized career development suggestions and guidance are provided, helping students better understand themselves and formulate reasonable career plans. The practice at Sichuan Agricultural University demonstrates that an AI career assessment system can offer students more precise and individualized career development support, enhancing their career planning skills and employment competitiveness.

The second component is leveraging VR technology to simulate interviews and workplace environments, enhancing students' practical skills and creating virtual training scenarios. VR technology, characterized by immersion, interactivity, and imagination, can provide students with realistic interview and workplace settings. By simulating interview scenarios with VR technology, students can conduct multiple mock interviews, familiarize themselves with interview procedures and techniques, and improve their interview skills. Additionally, VR technology can be used to create virtual training environments where students can engage in hands-on practice in a simulated setting, enhancing their practical abilities and professional

competencies.

5.3. Dynamic decision-making and curriculum optimization

On the one hand, based on enterprise recruitment data and industry trends, a demand forecasting model can be built to dynamically adjust enrollment scales for different majors. Enterprise recruitment data and industry trends reflect the market's demand for talent. By analyzing and mining this data, future market demand trends for various majors can be predicted. Local universities can use demand forecasting models to dynamically adjust enrollment scales, optimize the structure of academic programs, and enhance the relevance and adaptability of talent cultivation.

For example, a comprehensive university in Sichuan used AI to analyze regional industry demands and introduced three interdisciplinary majors, including "Intelligent Medical Technology" in 2023. By leveraging AI technology to analyze regional industry demands, the university identified a rapid increase in the demand for talent in the intelligent medical field. Consequently, it promptly introduced "Intelligent Medical Technology" and two other interdisciplinary majors to meet market needs. This initiative not only improved the university's talent cultivation quality and employment competitiveness but also contributed to regional economic development.

On the other hand, micro-courses such as "Python Skills Enhancement" and "Workplace Communication Training" can be recommended based on students' weak areas, enabling intelligent course recommendations. Every student has different learning situations and ability levels. By analyzing students' learning data and assessment results, their weak areas can be identified. Subsequently, targeted micro-courses can be recommended to help students improve their skills in a focused manner. Intelligent course recommendations can enhance learning efficiency and effectiveness, promoting students' overall development.

6. Challenges and countermeasures

Although artificial intelligence offers significant advantages in employment guidance at local universities, it also faces certain challenges that require appropriate countermeasures.

6.1. Challenges

First, data privacy risks—student information collection must comply with the requirements of the Personal Information Protection Law. The AI-powered employment guidance process requires collecting large amounts of student data, including personal information, academic performance, and career preferences. This data involves students' privacy, and if mishandled, it could lead to data breaches and unnecessary losses for students. Therefore, when collecting and using student information, it is crucial to strictly adhere to the Personal Information Protection Law and implement effective security measures to safeguard student data.

Second, technological dependence and lack of humanistic guidance—overreliance on algorithms may lead to insufficient career value orientation. While AI technology can provide precise employment guidance and services, it cannot replace human emotions and values. Excessive reliance on algorithms may result in a lack of humanistic care in career guidance, neglecting students' individuality and personal needs. Additionally, algorithmic decisions are based on data and models, often lacking direction in shaping students' career values, which may lead to biases in their career choices.

6.2. Countermeasures

First, establishing an "AI + Humanities" dual-driven model by embedding the guidance of socialist core values into intelligent recommendations. While utilizing AI technology for career guidance, it is essential to emphasize humanistic care and value-based guidance. By integrating socialist core values into intelligent recommendation systems, students can be guided to develop correct career values and employment perspectives, fostering their sense of social responsibility and professional ethics.

Second, deepening school-enterprise collaboration by jointly developing customized AI tools with technology companies, such as an "AI Resume Diagnosis System." School-enterprise collaboration is a crucial approach to promoting the application of AI in career guidance. Through cooperation with enterprises, universities can leverage companies' technological expertise and practical experience to develop AI tools that better align with market demands and students' actual needs. For example, an "AI Resume Diagnosis System" can use AI technology to analyze and evaluate students' résumés, identify issues, and provide corresponding revision suggestions, helping students enhance the quality of their résumés and increase their employment opportunities.

Third, improving policy support by establishing special government funds to support the intelligent transformation of local university employment service platforms. Local governments can set up dedicated funds to provide financial assistance for the digital upgrading of university employment service platforms. Additionally, policies should be formulated to encourage universities and enterprises to strengthen cooperation and jointly promote the application of AI in career guidance. A well-developed policy framework can create a favorable environment and development space for the application of AI in employment guidance at local universities.

7. Conclusion

Artificial intelligence technology provides technological support and innovative pathways for improving the quality of employment guidance in local universities. Through intelligent matching, data-driven decision-making, and personalized services, AI can effectively alleviate the supply-demand mismatch and promote high-quality employment for graduates. In the future, further exploration is needed to deepen the integration of technology and education, building a sustainable smart employment ecosystem. Subsequent research should focus on assessing the effectiveness of AI applications in career guidance and finding ways to balance technological applications with humanistic care to continuously optimize employment guidance in local universities.

Disclosure statement

The author declares no conflict of interest.

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