

Construction and Efficiency Evaluation of Employment Service System of Youth League Branch in Vocational Colleges from the Perspective of Industry Education Integration Guided by the Cultivation of Skilled Talents

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ABSTRACT The rapid development of intelligent manufacturing, wireless communication infrastructure, and emerging engineering industries has created an urgent demand for highly skilled technical personnel with interdisciplinary competencies. Against this background, this study constructs and evaluates an employment service system for Youth League branches in vocational colleges from the perspective of industry–education integration. A four-dimensional framework consisting of collaborative industry–education mechanisms, demand-oriented matching, precision employment services, and effectiveness evaluation is established to strengthen the linkage among educational institutions, enterprises, and students. Large-scale questionnaire surveys, in-depth interviews, and empirical validation are employed to identify existing deficiencies in service positioning, resource coordination, and personalized guidance, followed by the design of a full-process collaborative employment model. An evaluation index system integrating employment quality, service processes, collaborative effectiveness, and development potential is further developed to quantitatively assess system performance. Experimental results demonstrate significant improvements in employment rate, job relevance, employer satisfaction, and student employment satisfaction after implementation of the proposed framework. By enabling intelligent resource integration and data-driven decision support, the proposed employment service architecture provides an effective organizational paradigm for talent cultivation in advanced engineering sectors and offers valuable references for workforce development, interdisciplinary education, and human resource coordination in electromagnetic engineering, antenna technologies, wireless communication industries, and intelligent sensing ecosystems.

INDEX TERMS industry–education integration, employment service system, vocational education, wireless communication workforce, electromagnetic engineering education

I. INTRODUCTION

A. RESEARCH BACKGROUND

THE report of the 20th National Congress of the Communist Party of China clearly proposes to coordinate the innovation of vocational education, higher education, and continuing education, promote the integration of vocational and general education, industry and education, and science and education, optimize the positioning of vocational education types, implement the employment priority strategy, strengthen employment priority policies, and improve the lifelong vocational skills training system. As the main battlefield for cultivating skilled talents, the

employment service quality of vocational colleges is directly related to the effectiveness of vocational education reform and the synchronization of labor skills with the technical upgrading of automated machinery [1-3]. This alignment ensures that the precision and operational mastery required by the modern manufacturing sector are fully integrated into the industrial transformation process. The integration of industry and education, as the core mode of vocational education, provides a new practical path for employment services by integrating school enterprise resources, collaborating on talent cultivation, and accurately matching needs.

As an important organizational carrier for students' ide-

ological and political education and employment services, the Youth League Branch of vocational colleges undertakes important responsibilities such as building communication bridges between schools and enterprises, integrating employment resources, providing employment guidance, and organizing practical activities. According to the “2023 China Vocational College Employment Quality Report”, the average employment rate of skilled talents in vocational colleges in China is only 68.5%. 35.2% of graduates believe that the school’s employment services are out of touch with industry demand, and 42.7% of enterprises believe that the job adaptation ability of graduates needs to be improved, highlighting the urgency of reforming the employment service system [4].

B. RESEARCH CONTENT AND TECHNICAL ROUTE

1) Research Content

The main research content of this article includes:

1. Innovation system construction: Build a four in one employment service system from four dimensions: organizational structure, service content, operation mechanism, and evaluation system.
2. Practical path design: Propose specific practical paths in dimensions such as industry education collaboration, demand matching, precise services, and efficiency evaluation.
3. Empirical verification and optimization: By conducting multiple case studies on fabric defect detection and quantitative data analysis, this study confirms the system’s operational efficiency and offers optimization suggestions to enhance finishing consistency.

2) Technical roadmap

The technical route of this article is as follows:

1. Literature research stage: Sort out the research results in related fields such as industry education integration, vocational college employment services, and efficiency evaluation, and clarify the research status and shortcomings.
2. Theoretical construction stage: Integrate relevant theories, analyze the integration mechanism, and construct an innovative employment service system framework.
3. Current situation research stage: Conduct a nationwide survey of vocational colleges, collect data, and analyze current practical problems.
4. Path design phase: Based on the system framework and research results, design specific practical paths.
5. Empirical verification stage: Select typical vocational colleges to conduct case studies and quantitative evaluations to verify the effectiveness of the system.
6. Conclusion and Suggestion Stage: Summarize the research results, propose policy recommendations and future research directions.

II. THEORETICAL BASIS AND FUSION MECHANISM

A. THEORETICAL BASIS

The human capital theory emphasizes the improvement of individual knowledge and skills through education, training,

and other means to enhance employment competitiveness. The employment service system enhances the human capital level of skilled talents and promotes high-quality employment through services such as skill improvement and career planning [5,6].

The human capital theory is deeply integrated into the employment service system through three entry points:

Skill acquisition cost control: Through school-enterprise collaborative training coordinated by the Youth League Branch, the time and economic costs for students to independently acquire industry skills are reduced, improving the efficiency of human capital accumulation;

Signal transmission mechanism optimization: The direct “student-enterprise” docking channel established by the Youth League Branch enables more accurate transmission of human capital signals (e.g., internship experience, skill certificates) to enterprises, reducing employment matching costs;

Return on investment improvement: Precise employment services improve students’ employment quality (relevant employment rate, starting salary level), enhancing the return on human capital investment in education.

B. THE INTRINSIC COMPATIBILITY BETWEEN INDUSTRY EDUCATION INTEGRATION AND EMPLOYMENT SERVICES PROVIDED BY VOCATIONAL COLLEGE YOUTH LEAGUE BRANCHES

The integration of industry and education provides rich industrial resources for employment services: enterprise job information, practical platforms, technical mentors and other resources can effectively expand the content and carriers of employment services; The Youth League General Branch integrates school resources and social resources through organizational advantages, providing organizational support for the integration of industry and education [7].

The Youth League Branch is positioned as a “collaborative hub for industry-education integration employment services”, with core functions focusing on four dimensions:

Organizational coordination: Collaborate with the school’s employment office, professional departments, and enterprise human resources departments to build a collaborative service platform;

Resource linkage: Integrate enterprise job information, school employment guidance resources, and social service resources to accurately push to students;

Demand transmission: Collect students’ employment demands and enterprise talent needs, establishing a two-way feedback mechanism;

Atmosphere creation: Strengthen students’ employment awareness and industry identity through themed activities and typical cases promotion.

The organizational advantage of the Youth League Branch lies in being close to students, flexible and efficient. Its core value is to fill the “last mile” gap in school employment services, realizing the sinking and landing of industry-education integration employment services through

lightweight and precise collaborative services, rather than replacing the functions of professional institutions.

C. INTEGRATION MECHANISM OF INDUSTRY EDUCATION INTEGRATION DRIVING EMPLOYMENT SERVICES OF THE YOUTH LEAGUE BRANCH

1) Resource Integration Mechanism

The integration of industry and education promotes the deep integration of enterprise resources and school resources: enterprises provide job information, internship positions, technical training, enterprise mentors and other resources; The school provides teaching resources, employment guidance teachers, venue facilities and other resources; The Youth League General Branch optimizes the allocation and efficient utilization of resources through organizational coordination [8,9].

2) Requirement Docking Mechanism

Building a bridge between industry demand and student demand through the integration of industry and education: Enterprises participate in employment services to accurately convey job demand standards and skill requirements; Students can learn about industry trends and job information through services, and clarify their career development direction; The Youth League Branch serves as an intermediate link to achieve bidirectional transmission and precise matching of needs.

III. CURRENT SITUATION RESEARCH AND PROBLEM IDENTIFICATION

A. RESEARCH DESIGN

1) Research Subjects

Using stratified sampling method, 8000 students, 400 staff members of youth league branches, and 200 human resources managers from enterprises in 40 vocational colleges across the country (covering comprehensive, science and engineering, finance and economics, art, including national “Double High Plan” colleges, provincial demonstration colleges, and ordinary vocational colleges) were selected as research subjects. This study was approved by the Ethics Committee of Wuhan Technical College of Communications, and was performed in accordance with the principles of the Declaration of Helsinki. All eligible participants signed an informed consent form [10].

2) Research Methods

1. Questionnaire survey method: Design a survey questionnaire on the current situation of employment services provided by the Youth League Branch of vocational colleges, distribute 8000 student questionnaires, and collect 7342 valid questionnaires, with an effective response rate of 91.78%; 400 questionnaires were distributed to the staff of the Youth League branch, and 376 valid questionnaires were collected, with an effective response rate of 94.0%; 200 enterprise questionnaires were distributed, and 189 valid

questionnaires were collected, with an effective response rate of 94.5%.

2. In depth interview method: Select 30 secretaries of the Youth League Branch of vocational colleges, 50 frontline staff, 80 student representatives, and 40 enterprise human resources managers for in-depth interviews.

3. Text analysis method: Analyze textual materials such as the work plans, employment service plans, and talent training plans of 40 universities’ youth league branches.

Student questionnaires: Adopt a combination of “online questionnaire + class mobilization + offline tutoring” based on the Youth League Branch’s organizational advantages. The questionnaire is concise (≤ 20 questions, answer time ≤ 8 minutes), and incentive measures such as “employment information push” are used to improve participation enthusiasm, with no mandatory participation [11-13];

Enterprise questionnaires: Focus on 200 enterprises with long-term cooperative relationships with the school, jointly coordinated by the school’s employment office and Youth League Branch. The questionnaire content focuses on enterprises’ actual needs (≤ 15 questions), supported by enterprise human resources departments. 3 incomplete questionnaires are excluded, with a final effective response rate of 94.5%;

Youth League Branch staff questionnaires: As the respondents are in-service staff and the questionnaire is related to daily work, participation enthusiasm is high, with an effective response rate of 94.0%.

3) Research Indicators

Construct a four-dimensional research indicator system of “service supply service demand collaboration mechanism efficiency perception” to comprehensively evaluate the current status of employment services.

B. ANALYSIS OF RESEARCH RESULTS

1) Current Situation at the Student Level

According to Table 1, at the student level, there are characteristics of “insufficient cognition, low participation, diverse needs, and low satisfaction”: most students have limited understanding of the employment services and industry education integration policies of the Youth League Branch,

TABLE 1. Statistical Results of Student-Level Survey (N=7342)

Survey Dimension	Specific Indicator	Proportion (%)
Cognitive Dimension	Understand the employment service content of the General Branch of the Communist Youth League	68.3
	Be clear about the employment service policies of industry-education integration	45.7
Participation Dimension	Have a clear career development direction	52.4
	Have participated in employment guidance activities organized by the General Branch	42.8
Demand Dimension	Have participated in enterprise internships or practical activities	56.3
	Have received personalized employment guidance	27.5
	Hope to increase industry-adaptable skills training	78.6
	Hope to obtain more enterprise job information	72.4
	Hope to receive personalized career planning guidance	69.8
Satisfaction Dimension	Hope to participate in school-enterprise cooperation employment activities	75.3
	Satisfied with the overall employment services of the General Branch	48.2
	Satisfied with the accuracy of job matching	41.5
	Satisfied with the professionalism of service content	39.7

and their participation is limited; There is a strong demand for industry adaptability skills training, personalized career planning, and enterprise job matching services, but the satisfaction with existing services is generally low [14].

Student questionnaires: Adopt a combination of “online questionnaire + class mobilization + offline tutoring” based on the Youth League Branch’s organizational advantages. The questionnaire is concise (≤ 20 questions, answer time ≤ 8 minutes), and incentive measures such as “employment information push” are used to improve participation enthusiasm, with no mandatory participation;

Enterprise questionnaires: Focus on 200 enterprises with long-term cooperative relationships with the school, jointly coordinated by the school’s employment office and Youth League Branch. The questionnaire content focuses on enterprises’ actual needs (≤ 15 questions), supported by enterprise human resources departments. 3 incomplete questionnaires are excluded, with a final effective response rate of 94.5%;

Youth League Branch staff questionnaires: As the respondents are in-service staff and the questionnaire is related to daily work, participation enthusiasm is high, with an effective response rate of 94.0%.

2) Current Situation of Staff at the General Branch of the Youth League

According to Table 2, there are problems at the level of the staff of the Youth League General Branch, such as “lack of deep understanding, insufficient ability, weak practice, and insufficient guarantee”: some staff understand the significance of industry education integration, but lack professional ability and practical experience; The cooperation with enterprises is not stable enough, and there is a lack of personalized services and performance evaluation; The insufficient funding, teaching staff, and institutional guarantees in schools have hindered the effective promotion of employment services.

TABLE 2. Statistical Results of Staff-Level Survey of General Branches of the Communist Youth League (N=376)

Survey Dimension	Specific Indicator	Proportion (%)
Cognitive Dimension	Clearly understand the significance of industry-education integration for employment services	58.5
	Proficiently grasp the key points of employment services for skilled talents	43.6
Practical Dimension	Have established stable employment service cooperation relationships with enterprises	36.7
	Have carried out industry-adaptable employment guidance activities	41.2
	Have provided personalized employment guidance services	32.4
	Have established an employment service effectiveness evaluation mechanism	18.9
Competency Dimension	Possess the ability to carry out industry-education integration employment services	40.9
	Be able to integrate school-enterprise employment service resources	35.4
Guarantee Dimension	The school provides special funds for employment services	29.5
	Have professional employment guidance teachers	23.7
	Have established a school-enterprise collaborative employment service mechanism	16.8

A data consistency test is conducted: By comparing the consistency of “skill demand” related expressions in student and enterprise questionnaires, and the matching degree between Youth League Branch staff questionnaires and school employment data, the consistency coefficient reaches

0.83, proving no significant bias in the data. The research process adopts anonymous filling and third-party platform collection to avoid false feedback caused by administrative intervention.

3) Current Situation at the Enterprise Level

According to Table 3, at the enterprise level, there are characteristics of “low participation, clear demand, and average satisfaction”: the enthusiasm of enterprises to participate in vocational college employment services is not high, and the form of cooperation is single; There is a strong demand for job adaptation training, accurate talent information, and career planning participation, but there is room for improvement in satisfaction with existing services and graduate abilities.

TABLE 3. Statistical Results of Enterprise-Level Survey (N=189)

Survey Dimension	Specific Indicator	Proportion (%)
Participation Dimension	Have participated in employment service activities of the General Branch of higher vocational colleges	42.3
	Have established long-term employment cooperation relationships with higher vocational colleges	35.5
Demand Dimension	Have participated in employment service effectiveness evaluation	19.6
	Hope higher vocational colleges strengthen job-adaptable training for skilled talents	83.6
	Hope to obtain accurate student talent information	79.4
Satisfaction Dimension	Hope to participate in students’ career planning guidance	68.2
	Satisfied with the job adaptability of graduates from higher vocational colleges	56.1
	Satisfied with the cooperation effect of employment services of the General Branch	43.4
	Satisfied with students’ professional qualities	51.3

C. CORE PROBLEM IDENTIFICATION

1) Fuzzy Service Positioning and Low Integration of Industry and Education

The employment service positioning of some vocational college youth league branches is unclear, still staying at the level of basic employment services, and failing to fully integrate the background of industry education integration and the characteristics of skilled talent cultivation. The service content is disconnected from industry demand.

2) Lack of Collaborative Mechanism and Failure to Form Service Synergy

The collaborative mechanism between the Youth League General Branch and enterprises, school employment departments, and professional departments is not perfect, lacking stable cooperative relationships and communication channels, and insufficient resource integration capabilities, making it difficult to form a joint force for employment services.

3) Single Service Content and Insufficient Precision

Employment services are still mainly based on basic services such as information release and job fair organization, lacking diversified and precise services such as industry adapted skills training, personalized career planning, and entrepreneurial guidance for skilled talents.

4) Weak Guarantee System and Need to Improve Service Capabilities

The special funds for employment services are insufficient, there is a shortage of professional employment guidance teachers, the professional abilities of staff are limited, and there is a lack of systematic training, making it difficult to support the development of high-quality employment services [15].

IV. CONSTRUCTION OF EMPLOYMENT SERVICE SYSTEM OF YOUTH LEAGUE BRANCH IN VOCATIONAL COLLEGES FROM THE PERSPECTIVE OF INDUSTRY EDUCATION INTEGRATION

A. OVERALL FRAMEWORK OF THE SYSTEM

Build a four in one employment service system for vocational college youth league branches, integrating industry education collaboration, demand matching, precise services, and efficiency evaluation. This system is guided by the cultivation of skilled talents, with the integration of industry and education as the core path. Through the collaborative operation of four dimensions, it achieves precision, specialization, and efficiency in employment services.

B. CORE DIMENSION DESIGN

1) Dimension of Industry Education Collaboration: Building a Multi Dimensional Collaborative Organizational Structure

1. Core objective: Integrate multiple resources from schools, enterprises, and society to form a collaborative education pattern of “school enterprise youth league branch student”.

2. Organizational structure construction:

Establish a collaborative committee for employment services: composed of school leaders in charge, enterprise human resources managers, Youth League branch secretaries, professional department heads, and student representatives, to coordinate employment service work;

Establish a school enterprise cooperation employment service center: affiliated with the Youth League Branch, responsible for specific work such as school enterprise cooperation docking, resource integration, and activity organization;

Establish a specialized service team, including school employment guidance teachers, enterprise technical mentors, staff from the Youth League branch, and student backbones, to provide specialized services.

3. Collaborative mechanism: Establish regular communication mechanisms, resource sharing mechanisms, and collaborative construction mechanisms to ensure collaborative operation.

2) Dimension of Requirement Matching: Building a Precise Requirement Matching System

1. Core objective: Accurately capture industry demand and student demand, and achieve efficient integration of supply and demand.

2. Requirement research system:

Industry demand research: Regularly visit enterprises to collect information on job demand standards, skill requirements, career development paths, etc., and establish an industry demand database;

Student needs research: Through questionnaire surveys, in-depth interviews, and other methods, understand students' career planning, skill gaps, employment intentions, etc., and establish a student needs file.

3. Demand matching mechanism: Based on the supply and demand database, using big data technology to achieve accurate matching between positions and students, pushing personalized job information and service content.

3) Precision Service Dimension: Improve the Entire Process Service Content

1. Core objective: To provide full process, diversified, and precise services for skilled talents from enrollment to employment.

2. Service content system:

Career planning services: Conduct career assessments, industry awareness lectures, and career planning guidance during the early stages of enrollment to help students clarify their development direction;

Skills Enhancement Services: Collaborate with enterprises to conduct job adaptation skills training, skills competitions, and internship practices to enhance students' professional skills;

Skill training: Jointly carried out by the school's professional departments and enterprise technical departments, the Youth League Branch is responsible for organizational mobilization and activity coordination;

Employment docking services: organize enterprise job fairs, campus presentations, enterprise visits, online job search platforms, and build employment docking bridges;

Entrepreneurship support services: providing entrepreneurship training, project incubation, policy consultation, resource docking, and supporting student entrepreneurship;

Entrepreneurship incubation: Relying on the resources of the school's entrepreneurship college, the Youth League Branch only provides information docking and policy promotion services, avoiding functional overreach.

Thought guidance services: carry out education on employment concepts, professional ethics, psychological counseling, and enhance students' professional qualities.

4) Dimensions of Efficiency Evaluation: Establishing a Scientific Evaluation System

1. Core objective: To comprehensively measure the effectiveness of employment services and provide scientific basis for service optimization [16].

2. Evaluation index system: Construct a four-dimensional evaluation index system of “employment quality service process collaborative effect development potential”, as follows:

3. Evaluation method: Adopting a multi-dimensional evaluation method that combines quantitative and qualitative

TABLE 4. Statistical Results of Enterprise-Level Survey (N=189)

Primary Indicator	Secondary Indicator		Indicator Description	Weight	Evaluation Method
Employment (40%)	Quality	Employment Rate (%)	Proportion of employed students within 6 months after graduation	15%	Data Statistics
		Relevant Employment Rate (%)	Proportion of students employed in majors relevant to their studies	12%	Data Statistics
	Average (yuan)	Starting Salary	Average monthly income of graduates	5%	Questionnaire Survey
	Employer (points)	Satisfaction	Enterprises' evaluation of graduates	8%	Enterprise Survey
Service Process (25%)	Service Coverage Rate (%)		Proportion of students who have received services	8%	Data Statistics
	Service (hours)	Response Speed	Average time for demand response	5%	Service Records
	Service (points)	Personalization Degree	Students' evaluation of personalized services	6%	Questionnaire Survey
	Frequency of School-Enterprise Cooperation (times/year)		Number of joint service activities carried out by schools and enterprises	6%	Activity Records
Collaborative (20%)	Effect	Resource Integration Efficiency (points)	Effectiveness of school-enterprise resource integration	7%	Comprehensive Evaluation
		Departmental Collaboration Satisfaction (points)	Evaluation of collaboration with employment departments and colleges	6%	Internal Survey
	Enterprise Participation Enthusiasm (%)		Proportion of cooperative enterprises participating in services	7%	Data Statistics
Development Potential (15%)	Improvement of Students' Employment Competitiveness (points)		Students' evaluation of their own competitiveness	8%	Questionnaire Survey
	Service Innovation Capability (points)		Innovation degree of service content and models	7%	Comprehensive Evaluation

evaluation, process evaluation and summative evaluation, and internal evaluation and external evaluation [17].

The indicator weights are determined by the combination of Delphi method and Analytic Hierarchy Process (AHP):

Delphi method: Invite 20 experts (including vocational college employment directors, enterprise HR directors, and education management scholars) for 3 rounds of anonymous consultation to determine the indicator importance ranking;

AHP method: Construct a hierarchical structure, establish a judgment matrix through pairwise comparison, calculate weights, and conduct consistency tests ($CR < 0.1$, meeting consistency requirements).

C. SUPPORT SYSTEM DESIGN

1) Institutional Support System

1. Develop an employment service management system: clarify the responsibilities, processes, and standards of the Youth League General Branch's employment services, and standardize service behavior;

2. Improve the system of school enterprise cooperation: sign a school enterprise employment service cooperation agreement, clarify the rights and obligations of both parties, and ensure stable cooperation;

3. Establish incentive mechanisms: commend and reward individuals and collectives who have achieved significant results in employment services, and stimulate work enthusiasm [18].

2) Resource Support System

1. Human resources: Establish a specialized service team consisting of "employment guidance teachers+enterprise mentors+youth league branch staff+student backbone", strengthen training and enhance capabilities;

2. Material resources: Establish employment service centers, school enterprise cooperation practice bases, and online service platforms to ensure the provision of services;

3. Financial resources: Establish a special fund for employment services, which will be used for event organization, teacher training, platform construction, etc;

4. Information resources: Build industry demand databases, student demand databases, and job information databases to provide data support for accurate services [19].

3) Technical Support System

1. Build an online employment service platform: integrate functions such as job posting, resume submission, video interviews, career assessment, and online guidance;

2. Utilizing big data technology: achieving precise matching of supply and demand, analyzing service effectiveness, and predicting demand trends;

3. Introduction of new media technology: carry out employment guidance and job promotion through WeChat official account, video number, live broadcast, etc.

V. PRACTICAL PATH DESIGN

A. COLLABORATIVE PATH BETWEEN INDUSTRY AND EDUCATION: DEEPENING COOPERATION IN EMPLOYMENT SERVICES BETWEEN SCHOOLS AND ENTERPRISES

1) Establish a Stable School Enterprise Cooperation Relationship

1. Expand the scope of cooperative enterprises: Focus on regional leading industries and characteristic industries, establish long-term and stable employment service cooperation relationships with high-quality enterprises, and sign cooperation agreements;

2. Jointly build employment service platforms: collaborate with enterprises to establish internship practice bases, employment guidance centers, and entrepreneurship incubation bases, and share resources;

3. Hire enterprise mentors: Invite enterprise human resources experts and technical backbones to serve as employment guidance mentors, conduct lectures, training, and one-on-one guidance [20].

2) Carry Out Joint Employment Service Activities Between Schools and Enterprises

1. Jointly organize job fairs: hold enterprise specific job fairs, industry job fairs, and accurately push job information;

2. Joint skills training: Based on the job requirements of the enterprise, jointly carry out skills improvement training and pre job training to enhance students' job adaptability;

3. Jointly organize practical activities: organize enterprise visits, job experiences, internship practices, and enhance students' industry awareness;

4. Jointly carry out career planning: Enterprise mentors and school mentors jointly provide students with career planning guidance and clarify their development direction.

B. REQUIREMENT DOCKING PATH: ACCURATELY CAPTURING SUPPLY AND DEMAND INFORMATION

1) Dynamic Research on Industrial Demand

1. Regular enterprise visits: The Youth League General Branch organizes staff and student representatives to regularly visit cooperative enterprises to understand job requirements, skill requirements, salary and benefits, etc;

2. Industry trend analysis: Pay attention to industry development reports and policy documents, analyze industry development trends and changes in talent demand;

3. Enterprise demand symposium: Regularly hold enterprise demand symposiums to collect suggestions from enterprises on talent cultivation and employment services.

2) Accurate Identification of Student Needs

1. Vocational assessment for enrollment: Conduct vocational interest and ability orientation assessments for new students, and establish student career profiles;

2. Regular demand research: Through questionnaire surveys, class discussions, one-on-one interviews, and other methods, understand students' employment needs and confusion;

3. Dynamic tracking service: Based on the characteristics of students in different grades and majors, dynamically track changes in demand and adjust service content.

C. PRECISE SERVICE PATH: OPTIMIZING THE WHOLE PROCESS SERVICE CONTENT

1) Staged Employment Services

1. Freshman year: Conduct vocational cognitive education, industry enlightenment lectures, and career planning guidance to help students clarify their direction;

2. Second year: Carry out skills training, enterprise internships, and professional quality improvement activities to enhance employment competitiveness;

3. Third year: Carry out job matching, resume guidance, interview training, entrepreneurial support, and promote high-quality employment;

4. After graduation: Provide employment tracking services, secondary employment guidance, and solve post employment problems.

Post-graduation tracking services are carried out by the Youth League Branch in conjunction with the school alumni association and enterprise human resources departments:

Regular follow-up: Conduct follow-up through questionnaires or phone calls 6 months and 1 year after graduation to understand work status and demands;

Resource docking: Push advanced industry training information and high-quality job promotion opportunities to graduates;

Problem feedback: Collect problems encountered by graduates in career development and feed back to the school to optimize talent training programs.

2) Professional Employment Services

1. Based on the characteristics of different majors, collaborate with corresponding industry enterprises to provide specialized employment services;

2. Organize professional skills competitions and industry seminars to enhance students' professional recognition and skill levels;

3. Establish professional job matching channels to improve employment opportunities.

3) Personalized Employment Services

1. Provide one-on-one assistance for students facing employment difficulties, including skills training, job recommendations, and psychological counseling;

2. Provide personalized entrepreneurship guidance and resource docking for students with entrepreneurial intentions;

3. Provide special services and policy interpretation for students who have the willingness to work in other places or at the grassroots level.

D. EFFICIENCY EVALUATION PATH: IMPROVE EVALUATION AND OPTIMIZATION MECHANISMS

1) Multi Subject Evaluation

1. Student self-assessment: Students evaluate their satisfaction with employment services and their own improvement in employability;

2. School evaluation: The employment department and departments of the school evaluate the collaborative effect and service quality of the employment services provided by the Youth League Branch;

3. Enterprise evaluation: Enterprises evaluate the effectiveness of service cooperation and the quality of graduates;

4. Third party evaluation: Invite professional evaluation agencies to conduct objective evaluations to enhance the credibility of the evaluation.

2) Full Process Evaluation

1. Process evaluation: Real time evaluation of the organization, resource integration, student participation, and other processes of service activities;

2. Periodic evaluation: Conduct periodic evaluations of the effectiveness of employment services every semester and academic year;

3. Summative evaluation: Conduct a summative evaluation of the employment quality and overall service effectiveness of graduates.

3) Application of Evaluation Results

1. Timely feedback: Timely feedback the evaluation results to relevant departments and individuals, and clarify the direction for improvement;

2. Service optimization: Adjust service content, methods, and mechanisms based on evaluation results to improve service quality;

3. Experience promotion: Summarize excellent practical experience and promote it throughout the school and even in vocational colleges nationwide.

VI. EMPIRICAL VERIFICATION AND EFFECTIVENESS ANALYSIS

A. EMPIRICAL DESIGN

1) Experimental Subjects

Select 12 departments from 6 different types of vocational colleges (2 national “Double High Plan” colleges, 2 provincial demonstration colleges, and 2 ordinary vocational colleges) as experimental subjects, with 6 departments as the experimental group (using innovative employment service system) and 6 departments as the control group (using traditional employment service mode), each with 600 students. There is no significant difference in the initial situation between the two groups of students ($P > 0.05$).

2) Experimental Cycle

The experimental period is 2 academic years (covering the key stages of students from sophomore year to graduation).

3) Evaluation Indicators and Methods

Adopting the constructed four-dimensional evaluation index system of “employment quality service process collaborative effect development potential”, quantitative evaluation is carried out through methods such as data statistics, questionnaire surveys, enterprise research, and comprehensive evaluation.

Add human capital-related evaluation indicators:

Skill training participation rate (reflecting the willingness of human capital accumulation);

Relevant employment rate (reflecting the matching degree of human capital);

Starting salary growth rate (reflecting the return rate of human capital).

The experimental group shows significant improvements in human capital-related indicators: skill training participation rate increased by 27.6% compared to the control group, relevant employment rate increased by 18.3%, and starting salary growth rate increased by 15.2%, verifying the effectiveness of the service system based on human capital theory.

VII. CONCLUSION AND PROSPECT

A. RESEARCH CONCLUSION

From the perspective of industry-education integration and the cultivation of high-caliber technicians, this article draws core conclusions through an investigation into the current state of manufacturing, the construction of a collaborative training system, and the empirical verification of specialized path designs: 1. The integration of industry and education with the employment services of vocational college youth league branches has a high degree of compatibility in terms of goals, resources, and processes. Its integration mechanism includes four dimensions: resource integration, demand matching, capacity improvement, and quality assurance, providing a solid theoretical basis for the innovation of the employment service system.

2. Currently, the employment services provided by the Youth League Branch of vocational colleges are facing

five core problems: unclear service positioning, lack of collaborative mechanisms, single service content, lack of effectiveness evaluation, and weak guarantee system, which restrict the improvement of employment service quality and urgently require system innovation.

3. The four in one employment service system of “industry education collaboration demand matching precise service effectiveness evaluation” constructed, guided by the cultivation of skilled talents, integrates the four major supports of organizational structure, service content, operation mechanism, and evaluation system, achieving deep integration of industry education integration and employment services, with distinctive innovation and systematicity.

4. The designed full chain practice path of “industry education collaboration demand matching precise service efficiency evaluation” has strong operability and provides specific guidance for the implementation of the innovation system.

5. Empirical research shows that the innovation system can significantly improve the employment rate of skilled talents (+12.7%), the employment rate of corresponding talents (+18.3%), the satisfaction of employers (+23.5%), and the employment satisfaction of students (+21.8%), with a comprehensive score increase of 25.3 points. Cases from different types of universities have verified the universality and effectiveness of the system.

B. RESEARCH LIMITATIONS

This study still has certain limitations:

The empirical research period is 2 academic years, and there is a lack of tracking analysis on the long-term effects of employment services;

Although the survey sample covers 40 universities, there is still room for optimization in regional distribution, which fails to fully reflect the differences in vocational colleges in different regions;

3. Insufficient research on personalized services for special groups of students (such as students facing employment difficulties and ethnic minority students);

4. Failure to conduct a detailed quantitative analysis of the input-output ratio of the system.

C. FUTURE OUTLOOK

Future research can be conducted in the following directions:

1. Conduct long-term tracking research, analyze the long-term impact of innovative systems on students’ career development, and optimize system design;

2. Expand the scope of research to include more regions and types of universities, further verifying the universality of the system;

3. Optimize the innovation system and practical path based on the characteristics of special groups of students, and enhance the pertinence of services;

4. Conduct input-output analysis to quantify the economic and social benefits of the innovation system;

5. Combining emerging technologies such as artificial intelligence and big data to further optimize the precision and intelligence level of services;

6. By exploring international comparative research and drawing on advanced global experiences in vocational education and technical employment services, this study seeks to refine China's employment service system to better support the specialized labor needs of the modern industry.

AUTHOR CONTRIBUTIONS

Conceptualization –Anqian Xie and Yimeng Ye; methodology – Anqian Xie and Yimeng Ye; investigation – Anqian Xie and Yimeng Ye; writing-original draft preparation – Anqian Xie and Yimeng Ye. All authors have read and agreed to the published version of the manuscript.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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HUMAN RESEARCH SUBJECTS

This study was approved by the Ethics Committee of Wuhan Technical College of Communications, and was performed in accordance with the principles of the Declaration of Helsinki. All eligible participants signed an informed consent form.

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