Statistical Approach to Evaluating the Efficacy of Career Guidance Programs on University Graduate Employability in China

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Abstract

This study aimed to develop a career guidance model for improving employment ability among Chinese undergraduate students and assess the impact of this model on students' employment ability. The research involved 17 Chinese experts and 100 instructors from 10 universities in Sichuan, China. The Delphi technique was employed to gather expert perspectives, while data on employment ability were collected using the College Student Employment Ability Questionnaire. The Cronbach's coefficient of the questionnaire is .869, and Cronbach's $\alpha > .80$ indicates excellent internal consistency, affirming the authenticity and credibility of the data in this study. Based on the statistical criteria defined from the results of the fourth-round inquiries, each Course needs to meet any two of the following conditions: arithmetic $\bar{x} > 3.5964$, Full Score Rate > .1020, and Cronbach's $\alpha < .3883$ to be preliminarily retained. The results of the third-round expert inquiries show that the course offerings meet the Arithmetic $\bar{x} > 3.3548$ criteria, Full Score Rate >.1987, and Cronbach's $\alpha < .5590$. The study found a significant improvement in students' employment ability after participating in the model, with the average score increasing from 16.11 to 20.33. These results underscore the effectiveness of targeted career guidance in enhancing undergraduate students' employment prospects. Most experts have passed all courses and course content by this round, with viable ideas identified. Career Education and Orientation received the highest response percentage (90.67%), followed by self-assessment (89.50%), industry-oriented skill development (87.50%), mentor support and networking (85.50%), industry insights and trend analysis (89.50%), job search and application assistance (90.80%), continuous review and improvement (87.50%), and follow-up counseling and support (89.50%).

Keywords: Career Guidance, Model, Employment Ability, Undergraduate Students, China

1. Introduction

The number of college graduates in China is projected to increase from 903,000 in 1999 to 11.76 million in 2023, leading to a significant expansion of the workforce and a highly competitive job market. The job market is becoming increasingly competitive, with traditional industries offering fewer job opportunities. Emerging sectors tend to have specific major requirements that take more work to meet, presenting a challenge to university students. Although students may hold high employment expectations, they often need help with an unclear career direction and a lack of necessary skills. This disparity between expectations and reality places immense pressure on students during their job search.

Furthermore, the onset of the COVID-19 pandemic has exacerbated these challenges, causing an accelerated economic downturn and intensifying the employment difficulties faced by graduates [1] [2] . Employment is closely tied to livelihood in China, making graduates' employment a national challenge requiring immediate attention and strategic responses.

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In response, the government has initiated a series of policies aimed at enhancing career planning and development. The Ministry of Education rolled out a plan in 2007 emphasizing the importance of career preparation for university students nationwide. The "National Medium and Long-Term Education Reform and Development Plan (2010-2020)" proposed strengthening students' ideals, academics, and psychology guidance. It also aimed to establish and improve a student development and exchange system.

In 2020, the Ministry of Education emphasized the need to strengthen college students' knowledge of career planning and conduct career planning for students at different grade levels nationwide. Includes employment guidance activities and psychological counseling services to support students' career development and employment. The "24365 Job Selection Plan" was implemented to collect job requirements from employers and graduates' job-seeking intentions to match graduates with suitable positions accurately.

The evaluation of career guidance programs can benefit from alternative methodologies for the assessment of career tools [3]. Additionally, innovative methods and techniques, such as group-based career guidance, are being utilized for effective career guidance interventions [4]. The evaluation of career guidance programs can benefit from alternative methodologies for the assessment of career tools [3]. Additionally, the perceived value in career guidance e-services can be evaluated using a proposed functional model [5].

The integration of educational data mining, explainable AI, and machine learning models to predict employment stability and students' employability has shown promising results in providing insights into individual employment outcomes. These approaches can aid in the development of teaching systems for career guidance programs and help students make informed decisions about their career growth [6]. In [7] demonstrated the performance evaluation and explainability of classifiers on educational data mining inspired career counseling, highlighting the benefits of using machine learning and explainable AI to analyze educational factors for career placements. The interdisciplinary evaluation of career guidance programs can benefit from a variety of methodologies and approaches. For instance, the use of technology, such as e-services, strategic planning, and cloud-based systems, can enhance the delivery and evaluation of career guidance [8]).

However, the current approach primarily focuses on the early and late stages of students' academic journeys, with critics arguing that more is needed. We are developing and evaluating a comprehensive, systematic, and optimized career guidance model to enhance the employability of undergraduate students in China [9].

2. Literature Review

2.1. Career Guidance

In 1909, the distinguished American scholar David Perkins introduced the concept of "career guidance" [10]. Over time, it underwent continual refinement and evolution, evolving from a guidance model to counseling in the 1950s. This shift emphasized the importance of the counselee's subjective consciousness, resulting in more practical counseling approaches [11]. In subsequent developments, the prominent scholar Roger proposed transitioning from career guidance to a career planning framework [12].

Western employment models, such as those of the United States, are comprehensive and multidimensional, offering various services [13] [14]. There is no government guarantee in the U.S. system, and career services are often provided through educational institutions, allowing graduates to make informed career choices [15].

In contrast, in China, despite the commendable efforts of many universities to provide robust career guidance services, challenges persist, often stemming from a shortage of teachers and resources, which can result in suboptimal guidance quality. The Ministry of Education and provincial and municipal education commissions in China have published employment guidance books for college students to address these challenges [16]. These publications provide information on evolving employment systems, procedures, skills, labor contracts, and employment agreements. However, despite these advancements, career guidance for college students in China continues to face certain challenges, notably the need for more rational thinking and a long-term vision for career development among students [17].

Nevertheless, Chinese colleges and universities are actively working to enhance their understanding and emphasis on career guidance to make future improvements to the system to support students' career planning better.

2.2. Employment Ability

The term "employment ability," introduced in 1909, fundamentally refers to the capacity to secure and proficiently perform a job within one's chosen profession [18]. The Employment skills and coordination team identifies competencies essential for employment, including academic achievements, practical work experience, workplace dynamics understanding, cognitive abilities, and personal attributes, fostering an individual's ability to secure employment and excel in their chosen career [19]. Professional knowledge and skills, a willingness to learn, self-management skills, effective communication abilities, teamwork, and interpersonal skills are required of employable graduates [20]—the concept of "Pre-Professional Identity" (PPI) in the context of college students' employability. Student's grasp of the skills, traits, behaviors, cultures, and philosophies related to their prospective careers and fields is referred to as (PPI) [21] [22]. It is important to note that there needs to be a unified consensus within the academic community regarding the definition of employability. In this article, employability mainly encompasses self-exploration, job-seeking skills, professionalism, gaining support, creativity, and sustainability.

2.3. Relationship between Career Guidance and Employment Ability

Scholars and policymakers in education and career development have been interested in research on the relationship between career advice and employment ability. Numerous studies have been conducted to investigate how career guidance treatments and services affect persons' employment abilities. Improving Career Decision-Making Professional counseling is critical in supporting individuals in making educated professional decisions. By matching personal interests, talents, and beliefs with appropriate work prospects, effective coaching can improve career decisions. Increase their employability by choosing occupations that are a good fit for them [23]. Development of skills and capabilities: Career counseling frequently includes giving training, courses, and tools to develop important employability skills. These abilities include communication, problem-solving, teamwork, and adaptability, all of which are highly valued by employers. Individuals can improve their employability and differentiate themselves in the job market by mastering these skills [24]. Obtaining labor market information, career counseling services provide current labor market information such as employment trends, industry demands, and salary expectations. Individuals who have access to this information can make better-educated judgments and target their job search efforts more effectively. Getting rid of skill mismatches: Effective career counseling assists in reducing skill mismatches between job seekers and employer demands. By directing individuals towards appropriate career routes based on their interests and abilities, there is a better probability of matching skill supply with job market demand [25]. Enhancing Job Satisfaction: When individuals receive appropriate career guidance and find jobs that align with their interests and skills, they are more likely to experience job satisfaction [26].

2.4. Delphi Technique

The Delphi Technique is an iterative approach that uses a systematic method to gather and synthesize expert opinions on complex issues [27]. This iterative method involves multiple rounds to reach consensus, enabling the development of effective strategies for addressing complex problems [28]. The Delphi Technique, a collaborative process involving a diverse group of experts, is a powerful tool for generating consensus and enhancing the quality of a career guidance model, thereby fostering a more robust and effective model. The Delphi Technique can be an effective way to gather information, establish priorities, and construct a model that improves students' job potential and career prospects when creating a career advice model for undergraduate students in China [29].

3. Method

3.1. The First Stage

An extensive literature review found a preliminary model suitable for Chinese university students' career guidance. To establish the career guidance model, the Delphi Technique was used. The study included 17 experts from China, selected through purposeful sampling. All experts held a master's degree or above or Associate Professor and had worked for at least five years. Each participant was individually invited, following Ludwig's belief that the number of

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participants was less important than the participants' expertise. Inductive data analysis was employed to interpret the collected data [30].

Each expert was requested to choose or recommend courses for the initial Career Guidance model and provide as many comments (ideas, solutions, approaches, etc.) In the second round of interviews, participants were not able to provide as much information as they did in the first round. The data collected from the initial interviews were analyzed using content analysis. The courses that were deemed suitable for the model by everyone were included in a Likert scale—questionnaire 1. Before the experts used the questionnaire in the second round, it passed reliability and validity assessments. Participants were invited to evaluate each response, add clarifications or supplements, remark on the viability of ideas, consider alternative methods for putting ideas into practice, and suggest new ideas. All responses were included in the questionnaire. Participants provided anonymous responses [29].

Compilation of the second round, the responses involved analyzing the concentration and coordination of expert ratings, selecting unit contents based on expert opinions, using the threshold method, calculating mean and full mark frequencies, and calculating variation coefficients. Ideas meeting the criteria of having means and full mark frequencies above the threshold and variation coefficients below the threshold were included in the revised idea list, encompassing comments, supplements, clarifications, and strategies. Questionnaire 2 was formulated based on additional information provided in the second round.

In the third round, the questionnaire experts were asked to rate or provide opinions on each Course for each stage, using a Likert scale with five levels. Once again, the concentration and coordination of expert ratings were analyzed, and unit contents were selected based on expert opinions using the threshold method. Mean and full mark frequencies, along with variation coefficients IQR, were calculated, and ideas meeting the criteria were included in the revised idea list, encompassing comments, supplements, clarifications, and strategies. Questionnaire 3 was formulated based on additional information provided in the second round.

In the fourth round, Questionnaire 3 was sent to the 17 experts, who were asked to indicate their "confirm," "no," or "reject" with each question regarding the model's settings for each Course. Feasible ideas were confirmed through this round of decision-making and reporting.

3.2. The Second Stage

One hundred teachers in the field of student work are invited to indicate their "confirm," "no," or "reject" with each question regarding the model's settings for each Course.

3.3. The Third Stage

After creating the model, A stratified random sampling of 30 graduates from 20 colleges at Sichuan University of Science and Engineering was conducted to form a group to test whether the model can promote Employment Ability.

4. Results and Discussion

To assess the consistency of expert opinions, we conducted data analysis in each round and presented the results using Kendall's coefficient（Table 1)

Table 1. Calculation and Results of Expert's Coordination Coefficient

	First round	Second round	Third round	Fourth round
Kendall Wa	.475	.667	.732	.761

In the first round of assessments, the calculated W value was determined to be .47, which falls within the range of .4 to .6. This suggests a moderate level of expert consensus. Subsequently, during the second to fourth rounds, the average W values ranged between .6 and .8, indicating high consistency among the experts.

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Table 2. Expert Opinions

Expert	Key Opinion of the Experts
Expert 1	I think "Career Education and Orientation" is indispensable in curriculum design. The modern professional development environment changes rapidly, and students must understand various industries' development trends, opportunities, and challenges. We should provide detailed career information and guidance to help them plan their career paths more clearly. In addition, it is also crucial to guide students to understand the influence of personal strengths and values on career choices, which will help them make more informed career decisions.
Expert 2	"Self-assessment" is the core of cultivating students' professional development ability. Students should be encouraged to reflect deeply on themselves and understand their interests, values, and abilities. Through self-assessment, students can better understand their strengths and weaknesses and lay the foundation for their career planning. Students develop vocational skills in a more targeted manner and enhance their competitiveness in the workplace.
Expert 3	The importance of "Industry-Oriented Skill Development" is self-evident. Students need skills that match real-world career requirements to make a difference in the workplace. We should provide students with practical projects and cases to acquire practical skills in practice. Achieved through simulation projects, internships, and industry collaborations. Students more quickly through these practical opportunities
Expert 4	"Mentor Support and Networking" is important in cultivating students' career development. Students gain hands-on experience sharing and mentorship through networking with industry professionals. They understand the working environment within the industry, but it also opens up more career opportunities for them. In addition, the mentor's network resources can provide students with practical workplace support and advice, enabling them to face career challenges more confidently.
Expert 5	The importance of "Industry-Oriented Skill Development" is beyond doubt. However, we must consider students' needs while fully developing skills. Different students may have different interests and strengths in different fields. Therefore, we should provide diversified training content to meet the needs of students in different career fields. Through tailor-made training, we help students to develop their potential better.
Expert 6	"Industry Insights and Trend Analysis" is an important way for students to connect with the actual industry. Lectures can let students understand the dynamics of different industries through industry research reports, market trend analysis, and case sharing. Students to grasp career opportunities better and make informed decisions about their career plans. In addition, lectures and interviews with industry experts allow students to gain direct access to practical industry insights.
Expert 7	"Job Search and Application Assistance" is a key step for students to enter the workplace smoothly. We should teach students how to write professional resumes, interview successfully, and communicate with potential employers. Through mock interviews and role-playing, students can improve their job-seeking skills. In addition, providing students with practical job-seeking guidance and employment information can help them better understand market demand and plan their careers more targeted.
Expert 8	"Continuous Review and Improvement" is the key to continuously optimizing course content. We should regularly gather feedback from students and employers to fine-tune course content. At the same time, it is also necessary to pay attention to changes in the development of the industry to ensure that the course content is consistent with actual needs. Through continuous curriculum improvement, we can ensure that students acquire the latest vocational skills and enhance their competitiveness in the workplace.
Expert 9	Besides, "Follow-up Counseling and Support" is crucial after graduation. Students may face different challenges in their career path and require ongoing counseling and support. Regular coaching and support can help them solve problems in their career development and adjust their career plans. They are achieved through programs of industry mentors and the utilization of alum resources.
Expert 10	In "Career Education and Orientation," we should encourage students to explore different career fields. They are achieved by holding industry exhibitions, employment talks, and career orientation courses. Help students understand different industries' characteristics and development trends and help them choose their career direction. In addition, we should also provide personal career counseling to help students make individualized career plans.

Expert 11	"Industry-Oriented Skill Development" needs to be adjusted according to the latest trends in the industry. We should closely contact industry partners to understand their talent needs. Depending on industry requirements, we can adapt course content to develop the skills students need. In addition, industry projects and internships are also important ways to develop practical skills, which can better prepare students for the workplace environment.
Expert 12	"Continuous Review and Improvement" includes the update of course content and the continuous docking with enterprises and industry partners. We should work closely with businesses to understand what they expect from their graduates. We can integrate real workplace demands into the curriculum by partnering with businesses. In addition, regular industry lectures and symposiums can help students better understand industry trends and prospects.
Expert 13	"Job Search and Application Assistance" can be achieved through mock interviews, resume writing, and job search coaching. We can provide real-world examples for students to hone their skills in a simulated job search. At the same time, we can also teach them how to use professional social media to connect with potential employers. In addition, practical career counseling and employment information is also a crucial step in helping students find a job successfully.
Expert 14	Mentor support and network building can be achieved through industry mentor programs and the utilization of alum resources. We can invite industry professionals as mentors to provide students with practical career guidance and advice. In addition, we can build alum networks and provide students with real-world career opportunities. Experience sharing from mentors and alums can help students gain a better understanding of the working environment and opportunities within the industry.
Expert 15	Regarding "Follow-up Counselling and Support," we should provide students with continuous career counseling and support. Students may face various problems in career development after graduation, and we can help them solve problems through regular career counseling and guidance. In addition, we can partner with businesses to provide graduates with practical career opportunities and projects.
Expert 16	"Self-Assessment" is not only about knowing yourself but also about understanding the requirements and trends of the industry. We should guide students to understand the skills and ability requirements of different career fields so that they can better develop themselves. In addition, personal values and interests also need to match with career development. We can help students clarify the direction of personal development through discussions and case studies.
Expert 17	"Continuous Review and Improvement" should cover continuous updating of course content while also focusing on collaboration with industry. We should regularly engage with industry partners for their feedback and suggestions for the curriculum. According to changes in the industry, we can adjust the course content promptly to ensure that the knowledge and skills learned by students align with actual needs. In addition, collaborations with industry can also provide students with practical career opportunities and projects.

The first round: After discussion, the experts considered that designing a career guidance model to influence employment ability for undergraduate students in China involves extensive review and understanding of local and global job markets, study of student dynamics, skills required in various industries, and knowledge of effective career guidance strategies. The model must be multidimensional, covering various factors like career orientation, skill development, and alignment with the employer's expectations. Here is a proposed design: Career Education and Orientation. Students are exposed to various career paths. Workshops, webinars, and lectures on different careers give students a broad idea of the opportunities available within and outside China. Self-Assessment: Ensuring students have an opportunity for introspection to identify what they are good at and enjoy doing. Personality tests, interest evaluation tests, and aptitude exams. Industry-Oriented Skill Development: This involves training programs or activities that allow students to develop skills required by industries. Partner with corporations to provide internships and skill-building projects, including soft skills like communication, leadership, problem-solving, and adaptability. Also, offer mentor support and networking. Implementing a mentorship program where experienced professionals guide students can help them gain a realistic view of their chosen field. Encourage networking events and online platforms where students can connect with potential employers. Industry Insights and Trend Analysis: Sharing regular reports on industry trends and job market statistics. The students understand the new tools, technology, or qualifications required in different job roles.

Job search and application assistance: We guide students on how to search and apply for jobs appropriately. This includes resume writing, cover letter preparation, and mock interview game plans.

Some students may require additional guidance even after being employed. Regular follow-up sessions can be very helpful for these students. One should continuously review and improve one's career path and development strategy to ensure one can adapt to changing circumstances and achieve one's career goals. Regular audits and reviews are necessary to ensure that the career path stays relevant and effective. However, before proceeding to the second round of inquiry, it is recommended to make some modifications based on the feedback received from the experts regarding the course settings for each stage.

The results of the second round of expert inquiries indicate that the course options available in the questionnaire meet the requirements for the arithmetic mean, full score rate, and coefficient of variation. Demonstrates that the experts hold a high opinion of the available course options and that their views are aligned. However, the analysis shows that two or three of the eleven indicators of the course content, such as Job-Specific Skills Training, Career Transition and Job Search Strategies, Web Development, Networking Fundamentals, Mentoring Skills Development, Online Networking, and Personal Branding, need improvement. Management, Industry-Specific Trend Analysis, Six Sigma, Employee Assistance Program (EAP) Training, and Diversity and Inclusion Training did not meet the statistical standards. These four courses have been dropped from the model in accordance with the screening requirements.

In the third round of expert inquiries, the revised questionnaire was sent to the 17 experts from the second round, and the response rate was 100%. The experts used a 5-point scale (Extremely Important, Important, Moderately Important, Unimportant, Completely Unimportant) to assess the importance of course content at different levels. Some experts provided further suggestions and modifications for the courses.

Table 3. Reliability Test Table of the Third Round of the Delphi Method Questionnaire

Cronbach Alpha	Number of Items
.869	43

Table 4. The Reference Boundary Value of the Third Round of Correspondence Courses

	Mean	Standard Deviation	Cut Off
Arithmetic Mean	4.1342	.5378	3.5964
Full Score Frequency	.2099	.1079	.1020
Coefficient of Variation	.4063	.1527	.5590

Based on the statistical criteria defined from the results of the fourth-round inquiries, each Course needs to meet any two of the following conditions: Arithmetic $\bar{x} > 3.5964$, Full Score Rate > .1020, and Cronbach's $\alpha < .3883$ to be preliminarily retained. The results of the third-round expert inquiries show that the course offerings meet the Arithmetic $\bar{x} > 3.3548$ criteria, Full Score Rate > .1987, and Cronbach's $\alpha < .5590$.

This indicates that the experts highly value the importance of all contents in this level of courses, and there is a high level of consensus and coordination among their opinions. The results of the expert inquiries regarding the course content are presented in Table 5.

Table 5. Results of the Third-Round Expert Inquiries

Course Content	Mean	Standard Deviation	Smallest	Maximum	Coefficient Of Variation	Full Score Frequency
Career Development and Planning	4.47	.624	3	5	.1396	.5294
Personal Branding	4.47	.624	3	5	.1396	.5294
Professional Communication	4.18	.728	2	5	.1742	.2941
Networking and Building Professional Relationships	4.53	.514	4	5	.1135	.5294

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Entrepreneurship and Small Business Management	4.29	.772	2	5	.1800	.4118
Financial Literacy and Money Management	4.41	.87	2	5	.1973	.5882
Leadership and Management Skills	4.29	.686	3	5	.1599	.4118
Workplace Ethics and Professionalism	4.29	.849	2	5	.1979	.4706
Industry-Specific Courses	3.18	1.59	1	5	.5000	.2353
Online Portfolio Development	2.29	1.105	1	4	.4825	.0000
Emotional Intelligence in the Workplace	4.29	.772	2	5	.1800	.4118
Personal Development and Goal Setting	2.47	1.281	1	5	.5186	.0588
Personality Assessment	4.24	.752	2	5	.1774	.3529
Strengths Finder	4.29	.588	3	5	.1371	.3529
Interest and Aptitude Assessment	4.24	.752	2	5	.1774	.3529
Emotional Intelligence (EI) Assessment	4.12	.993	2	5	.2410	.4118
Values Assessment	2.88	1.409	1	5	.4892	.1765
Goal Setting and Self-Reflection	2.88	1.409	1	5	.4892	.1765
Digital Marketing	4.18	.951	2	5	.2275	.4118
Data Analytics	4.06	.966	2	5	.2379	.3529
Project Management	4.65	.606	3	5	.1303	.7059
Cybersecurity	4.24	.562	3	5	.1325	.2941
Professional Relationship Building	4.41	.618	3	5	.1401	.4706
Networking Strategies for Career Advancement	4.59	.795	2	5	.1732	.7059
Industry Research and Market Analysis	4	.866	2	5	.2165	.2353
Emerging Technologies and Industry Disruptions	4.35	.786	2	5	.1807	.4706
Competitive Intelligence	4.12	.781	2	5	.1896	.2941
Data Analytics for Industry Trends	4.12	.697	2	5	.1692	.2353
Future Trends and Scenario Planning	4.35	.786	2	5	.1807	.4706
Cover Letter Writing	4.12	.781	2	5	.1896	.2941
Interview Skills and Techniques	4.41	.795	2	5	.1803	.5294
Job Search Strategies	4.24	.831	2	5	.1960	.4118
LinkedIn Profile Optimization	4.35	.786	2	5	.1807	.4706
Job Application Etiquette and Follow-up	4.59	.618	3	5	.1346	.6471
How to Identify and Optimize Priorities at Work	4.41	.87	2	5	.1973	.5882
How to Reflect on Past Experiences and Achievements	4.53	.514	4	5	.1135	.5294
Identifying Personal Strengths and Areas for Improvement	4.24	.664	3	5	.1566	.3529

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Course Content	Mean	Standard Deviation	Smallest	Maximum	Coefficient Of Variation	Full Score Frequency
Creating Short-Term and Long-Term Career Development Plans	4.41	.712	3	5	.1615	.5294
seek and receive effective feedback	4.18	.809	2	5	.1935	.3529
Workplace Mental Health and Wellness	4.53	.624	3	5	.1377	.5882
Conflict Resolution and Mediation	4.29	.772	2	5	.1800	.4118
Stress Management and Resilience Building	4.41	.618	3	5	.1401	.4706
Workplace Coaching and Feedback	4.18	.809	2	5	.1935	.3529

The results of the third round of evaluation indicate that the arithmetic mean, full score rate, and coefficient of variation of the course offerings all meet the established standards. Expert opinions are highly important; there is strong consensus among the experts, and their coordination is good.

However, during the statistical analysis of course content settings, it was observed that two or three indicators from the following three courses—Industry-Specific Courses, Online Portfolio Development, and Values Assessment—did not meet the statistical criteria defined in this study. These four courses have been removed from the model following the screening criteria.

Furthermore, it was noted that the courses Personal Development and Goal Setting and Goal Setting and Self-Reflection have similar settings and should be merged. To assess the consensus among the 17 experts, the data were analyzed using mode, median, and quartile measures (Table 6).

Table 6. The result of Experts' Opinions of the Career Guidance Model

Course	Course Content	$\bar{x}$	Opinion of Experts	SD.	IQR	Consensus
Career Education and Orientation	Career Development and Planning	4.53	Strongly Agree	.717	1	Congruence
	Personal Branding	4.18	Moderately Agree	.529	.5	Congruence
	Professional Communication	4.59	Strongly Agree	.507	1	Congruence
	Networking and Building Professional Relationships	4.47	Moderately Agree	.624	1	Congruence
	Entrepreneurship and Small Business Management	4.47	Moderately Agree	.624	1	Congruence
	Financial Literacy and Money Management	4.18	Moderately Agree	.529	.5	Congruence
	Leadership and Management Skills	4	Moderately Agree	.707	1	Congruence
	Workplace Ethics and Professionalism	4.24	Moderately Agree	.664	1	Congruence
	Emotional Intelligence in the Workplace	4.24	Moderately Agree	.562	1	Congruence
Self-Assessment	Personality Assessment	4.59	Strongly Agree	.507	1	Congruence
	Strengths Finder	4.59	Strongly Agree	.618	1	Congruence
	Interest and Aptitude Assessment	4.24	Moderately Agree	.664	1	Congruence
	Emotional Intelligence (EI) Assessment	4.35	Moderately Agree	.786	1	Congruence
	Goal Setting and Self-Reflection	4.41	Moderately Agree	.618	1	Congruence
Industry-Oriented Skill Development	Digital Marketing	4.53	Strongly Agree	.514	1	Congruence
	Data Analytics	4.41	Moderately Agree	.712	1	Congruence
	Project Management	4.24	Moderately Agree	.664	1	Congruence
	Cybersecurity	4.41	Moderately Agree	.618	1	Congruence
	Professional Relationship Building	4.29	Moderately Agree	.47	1	Congruence

Course	Course Content	$\bar{x}$	Opinion of Experts	SD.	IQR	Consensus
Mentor Support and Networking	Networking Strategies for Career Advancement	4.35	Moderately Agree	.606	1	Congruence
Industry Insights and Trend Analysis	Industry Research and Market Analysis	4.35	Moderately Agree	.493	1	Congruence
	Emerging Technologies and Industry Disruptions	4.29	Moderately Agree	.686	1	Congruence
	Competitive Intelligence	4.41	Moderately Agree	.618	1	Congruence
	Data Analytics for Industry Trends	4.29	Moderately Agree	.686	1	Congruence
	Future Trends and Scenario Planning	4.41	Moderately Agree	.618	1	Congruence
Job Search and Application Assistance	Cover Letter Writing	4.47	Moderately Agree	.514	1	Congruence
	Interview Skills and Techniques	4.24	Moderately Agree	.752	1	Congruence
	Job Search Strategies	4.29	Moderately Agree	.686	1	Congruence
	LinkedIn Profile Optimization	4.29	Moderately Agree	.588	1	Congruence
	Job Application Etiquette and Follow-up	4.53	Strongly Agree	.514	1	Congruence
Continuous Review and Improvement	How to Identify and Optimize Priorities at Work	4.59	Strongly Agree	.507	1	Congruence
	How to Reflect on Past Experiences and Achievements	4.59	Strongly Agree	.507	1	Congruence
	Identifying Personal Strengths and Areas for Improvement	4.41	Moderately Agree	.507	1	Congruence
	Creating Short-Term and Long-Term Career Development Plans	4.41	Moderately Agree	.507	1	Congruence
	Seek and receive effective feedback.	4.35	Moderately Agree	.493	1	Congruence
Follow-up Counselling and Support	Workplace Mental Health and Wellness	4.47	Moderately Agree	.514	1	Congruence
	Conflict Resolution and Mediation	4.65	Strongly Agree	.493	1	Congruence
	Stress Management and Resilience Building	4.47	Moderately Agree	.514	1	Congruence
	Workplace Coaching and Feedback	4.41	Moderately Agree	.507	1	Congruence

Note:

$\bar{x}$= Mean (1.00 - 1.49 = Strongly Disagree; 1.50 - 2.49 = Disagree; 2.50 - 3.49 = Neutral; 3.50 - 4.49 = Moderately Agree; 4.50-5.00 = Strongly Agree); SD. = Standard Deviation; IQR = Interquartile Range (IQR< .50 ≥ 1.00 = Congruent; IQR>1.00 = Incongruent).

According to the findings, the industry professionals are in complete accord regarding the following training programs: career development and planning, professional communication, personality assessment, strengths finder, digital marketing, job application etiquette and follow-up, lean management, process improvement and workflow analysis, and conflict resolution and mediation. They moderately agree on Personal Branding, Networking and Building Professional Relationships, Entrepreneurship and Small Business Management, Financial Literacy and Money Management, Leadership and Management Skills, Workplace Ethics and Professionalism, Emotional Intelligence in the Workplace, Interest and Aptitude Assessment, Emotional Intelligence (EI) Assessment, Goal Setting and Self-Reflection, Data Analytics, Project Management, Cybersecurity, Professional Relationship Building, Networking Strategies for Career Advancement, Industry Research and Market Analysis, Emerging Technologies and Industry Disruptions, Competitive Intelligence, Data Analytics for Industry Trends, Future Trends and Scenario Planning, Cover Letter Writing, Interview Skills and Techniques, Job Search Strategies, LinkedIn Profile Optimization, Performance Management and Improvement, Agile Project Management, Kaizen and Continuous Improvement Culture, Workplace Mental Health and Wellness, Stress Management and Resilience Building, Workplace Coaching and Feedback in their adoption of the career guidance model. In the fourth round, the 17 experts are required to answer the questionnaire with either "confirm" or "deny" [31]. A "confirm" response rate of 80% or above is considered a pass. The opinions of experts on eight courses can be calculated. The result shows that all courses and course contents have passed.

In the second stage, 100 teachers involved in student work, such as counselors, employment guidance, career planning teachers, assistant teaching, pedagogy, and psychology, need to answer the questionnaire with either "confirm" or "deny"[31]. A "confirm" response rate of 80% or above is considered a pass. Experts' opinions on eight courses can be calculated (Table 7).

Table 7. The result of the Resolution and Report of 100 Instructors for the Course

Course	Confirmation (Percentage)	Disconfirmation (Percentage)	Reject (Percentage)
Career Education and Orientation	90.67%	6.89%	2.44%
Self-Assessment	89.40%	5.40%	5.20%
Industry-Oriented Skill Development	87.50%	4.75%	7.75%
Mentor Support and Networking	85.50%	8.00%	6.50%
Industry Insights and Trend Analysis	89.40%	5.20%	5.40%
Job Search and Application Assistance	90.80%	4.40%	4.80%
Continuous Review and Improvement	87.80%	6.40%	5.80%
Follow-up Counselling and Support	89.50%	6.25%	4.25%

Career Education and Orientation had a yes response percentage of 90.67%, a no response percentage of 6.89%, and an unsure response percentage of 2.44%. Self-Assessment received a yes response percentage of 89.40%, a no response percentage of 5.40%, and an unsure response percentage of 5.20%. Industry-Oriented Skill Development had a yes response percentage of 87.50%, a no response percentage of 4.75%, and an unsure response percentage of 7.75%. Mentor Support and Networking received a yes response percentage of 85.50%, a no response percentage of 8.00%, and an unsure response percentage of 6.50%. Industry Insights and Trend Analysis had a yes response percentage of 89.40%, a no response percentage of 5.20%, and an unsure response percentage of 5.40%. Job Search and Application Assistance received a yes response percentage of 90.80%, a no response percentage of 4.40%, and an unsure response percentage of 4.80%. Continuous Review and Improvement had a yes response percentage of 87.80%, a no response percentage of 6.40%, and an unsure response percentage of 5.80%.

Follow-up Counseling and Support received a yes response percentage of 89.50%, a no response percentage of 6.25%, and an unsure response percentage of 4.25%. Most experts passed all courses and course content by this round, and viable ideas have been identified. Ultimately, a career guidance model comprising eight courses with 39 contents was finalized (Figure 1).

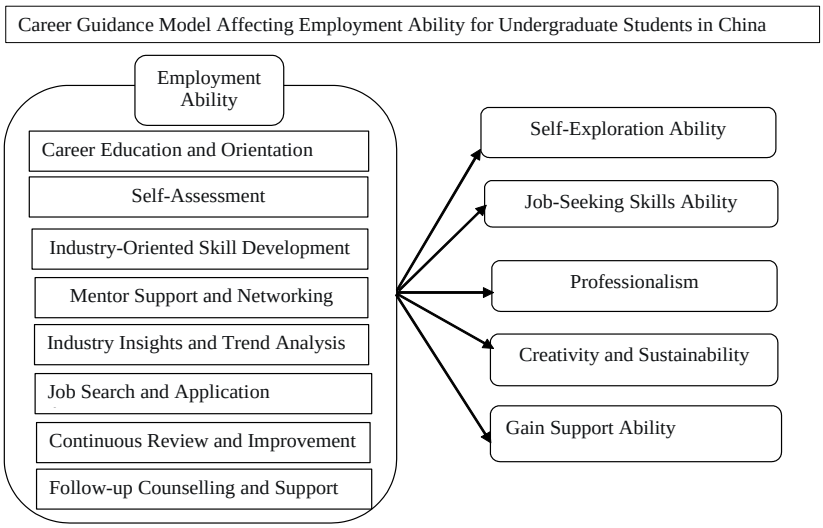

Figure 1. Career Guidance Model Affecting Employment Ability for Undergraduate Students in China

After obtaining the Career Guidance Model Affecting Employment Ability for Undergraduate Students in China through the Delphi technique, a random selection of 30 graduates from each college at Sichuan University of Science and Technology (ensuring that each college had at least one participant) was conducted to form an experimental group. These participants received systematic guidance on career guidance. Before implementing the career guidance, a pretest was administered to the 30 participants using the College Student Employment Ability Questionnaire (CSEQ), a suitable employment ability measurement tool for Chinese university students. This questionnaire assesses Self-exploration ability, job-seeking skills ability, professionalism, support ability, Creativity, and Sustainability.

Following completing the courses related to the Career Guidance Model, a posttest was conducted on the same 30 participants to observe the impact of career guidance on their employment ability. The results showed that career guidance positively affected the students' employability.

Table 8. Pretest and Posttest Comparison of Employment Ability Dimensions before and After Career Guidance Intervention

Dimensions of Employ Ability	P-value before attending the employment guidance course and after attending the employment guidance course				Significant
	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	
Self-Exploration Ability	2.75	.347	4.26	.101	.002**
Job-Seeking Skills Ability	3.23	.274	4.45	.302	.007***
Professionalism	2.6	.577	3.8	.361	.038**
Gain Support Ability	3.57	.230	3.68	.144	.072*
Creativity and Sustainability	3.96	.07	4.01	.091	.05**
Employment Ability	16.11	.884	20.33	.564	.002**

∗ = p<.1; ∗∗ = p<.05; ∗∗∗ = p<.01

The above results indicate that self-exploration, job-seeking skills, professionalism, support ability, creativity, and sustainability have different degrees of improvement. Among them, the improvement in job-seeking skills ability is the most significant.

5. Conclusion

This comprehensive study has focused on the intricacies of career guidance courses, drawing upon an extensive review of the current landscape of career guidance education in China and globally. Through the rigorous application of the Delphi technique, an intricate career guidance course, along with its corresponding content system, meticulously tailored to the distinctive context of Sichuan University of Science and Engineering (SUSE), was meticulously developed. These carefully crafted solutions encompass a multitude of dimensions with far-reaching implications. Firstly, they are adept at addressing the specific, nuanced needs of SUSE's diverse student body, considering their academic disciplines, career aspirations, and individual ambitions. Furthermore, this initiative is a powerful catalyst for fostering student career development. Equipping them with pertinent, hands-on knowledge, practical skills, and invaluable resources empowers them to make informed career choices, explore diverse professional avenues, and cultivate a clear and coherent vision for their future endeavors.

Additionally, this well-structured career guidance curriculum is potent for enhancing students' employability. It hones their skills and nurtures their competencies to align with the demands and expectations of prospective employers, rendering them increasingly attractive and competitive in the dynamic job market upon graduation. Moreover, the Course's resonance with students' interests and aspirations augments their engagement levels in the learning process, rendering it more profound and productive. In addition, this program is an indispensable pillar of support for career advisors and counselors at SUSE, furnishing them with a systematic framework to offer bespoke guidance to students,

steering them toward astute career planning and informed decision-making. It bolsters the institution's reputation as one dedicated to its students' holistic development and triumph and magnetizes a burgeoning cohort of prospective students and stakeholders. Lastly, by meticulously aligning with the economic and industrial difficulties of the region, a university-specific career guidance course becomes a potent instrument for fortifying the capabilities of graduates, thus enabling them to meaningfully contribute to the local workforce and foster overall regional development. Conceiving and implementing a tailor-made career guidance course and its accompanying content system, calibrated precisely for the Sichuan University of Science and Engineering, carries profound implications. It empowers students, elevates their employability prospects, and seamlessly aligns their career trajectories with the university's mission and the overarching requirements of the region.

6. Declarations

6.1. Author Contributions

Conceptualization: L.G., T.S., P.P.V., and S.P.; Methodology: T.S. and M.P.; Software: L.G.; Validation: L.G., T.S., P.P.V., and S.P.; Formal Analysis: L.G., T.S., P.P.V., and S.P.; Investigation: K.D. and M.P.; Resources: K.D.; Data Curation: K.D.; Writing Original Draft Preparation: K.D., L.G., and T.S.; Writing Review and Editing: K.D., L.G., and T.S.; Visualization: L.G. and M.P.; All authors have read and agreed to the published version of the manuscript.

6.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

6.3. Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

6.4. Institutional Review Board Statement

Not applicable.

6.5. Informed Consent Statement

Not applicable.

6.6. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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