Research Article

A Career Guidance and Career Planning Assessment Method Based on Improved Correlation Analysis

Yun Han

Student Potential Development Center, Xi’an Peihua University, Xi’an 710000, Shaanxi, China

Correspondence should be addressed to Yun Han; 150152@peihua.edu.cn

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The number of college graduates in China has dramatically risen in recent years, the employment structural contradiction is evident, and the pressure on employment is gradually increasing. How to improve the employment rate of graduates and the quality of employment is an important issue at present. In order to fundamentally solve the employment problem, there are some other ways besides changing the talent cultivation mode of colleges and universities, such as carrying out career guidance work. At present, the career guidance model in China’s universities is still limited to the traditionalized guidance model, which is too consistent. In order to meet the needs of the development of the market economy and the development of students’ individuality, it is necessary to study the construction of a personalized career guidance model. This study first analyzes the current situation of career guidance work in China’s colleges and universities and puts forward the importance and necessity of building a personalized career guidance model. Subsequently, based on improved correlation analysis, this research provides a method for evaluating employee knowledge and career planning. The experimental results suggest that the proposed method can accurately assess the impact of job counseling and establish the groundwork for future job counseling and career planning work in colleges and universities.

1. Introduction

In recent years, the number of college graduates in China has significantly increased, the structural contradiction of employment is prominent, and the trend of supply and demand is not optimistic [1]. With the rapid advancement of China’s higher education from “elite education” to “mass education,” the problem of difficult employment for college graduates is becoming more and more prominent [2]. The causes of employment difficulties are multifaceted and multifaceted, but mainly in the fact that the talent training mode and the market have not yet formed an effective docking. Education has an important historical mission to build a well-off society and a harmonious socialist society. To promote the construction of a harmonious socialist society, we must give full play to democracy and fully embody the harmonious coexistence of man and nature [3]. The employment project of college graduates is a systematic project, which is related to the country’s livelihood, society, universities, families, and individuals in many aspects. Implementing personalized employment guidance, deeply integrating the humanistic principle, and enhancing the employability of college students are the key to solving the employment problem. Employment is the foundation of people’s livelihood [4]. While grasping quality management, higher education should focus on strengthening the construction and implementation of the employment guidance service system. We should insist on implementing an active employment policy, strengthening government guidance, improving market mechanisms, expanding employment scale, and improving employment structure.

The goal of career guidance has expanded from achieving. The goal of career guidance is to expand from “matching people with jobs and making the best use of their talents” to “career satisfaction.” The trait factor theory matches human characteristics with occupational factors in order to achieve the “best fit.” Psychological needs theory and psychodynamic theory began to focus on the inner
needs of people to be satisfied by their occupation [5]. At the same time, the shape of career guidance has shifted from static career guidance to dynamic career counseling. To improve the employability of college graduates and solve the current problem of difficult employment of college graduates, the construction of personalized employment guidance mode and the implementation of personalized employment guidance are also based on the concept of "matching people with jobs and making the best use of talents" [6]. How do solve the problem of difficult employment for college students? Obviously, in addition to the talent cultivation mode to keep pace with the times and meet the market, it is also necessary to enhance the employability of graduates by other means, such as building a personalized employment guidance mode and carrying out personalized employment guidance. Combining education and productive work is not only a way to improve social productivity but also an important way to create diverse and individualized human development [7]. Career guidance is an important bridge between education and productive work; therefore, it should be an important way to create diversified and individualized development of people. The diversified career guidance approach is shown in Figure 1.

One of the ultimate goals of career guidance is to cultivate diverse and individually developed people who can adapt to the needs of social and economic development. The current situation of career guidance work in China’s higher education institutions is combined [8]. The theoretical idea and framework structure of constructing a personalized career guidance model in colleges and universities are proposed. It fully reflects the requirements of personality development, promotes the improvement of the level of career guidance, and realizes the benign development of higher education [9]. This study proposes a method to evaluate employee knowledge and career planning based on improved correlation analysis, and the experimental results show that the proposed method can well evaluate the effect of employment guidance.

This study's organization paragraph is as follows: the related work of this study is presented in Section 2. Section 3 analyzes the design of the application method. Section 4 discusses the experiments and results. Finally, in Section 5, the research work is concluded.

2. Related Work

In this chapter, we define the current status of research on career guidance, the current status of research on career planning, and the current state of research in association analysis in detail.

2.1. Current Status of Research on Career Guidance. According to the changes in the employment system of college students in China, the Ministry of Education and provincial and municipal education commissions, some universities have edited and published some college students’ employment guidance from books [10]. These series of books are generally used as teaching materials for college students’ employment guidance courses or guiding schools to carry out employment guidance work. The content mainly includes the change in college students’ employment system, college students’ employment procedures and skills, labor contracts, and employment agreements [11]. A better phenomenon is that scholars are paying more and more attention to the career design and planning of college students and college entrepreneurship, but the localization of their theories and how to put them into practice still need further research [12]. The full-scale career advice model is the more developed system in terms of career guidance model research. Scholars have also performed a comparison study of college students’ career advice models in China and the United States, which is a “developmental” career guidance model, against China, which is a “procedural” career guidance approach [13]. Subsequently, scholars have explored the whole career guidance model. However, there is no research on personalized career guidance models based on scientific development concepts, humanistic principles, and career planning theory.

Foreign research mainly focuses on two aspects: theory and practical application. Foreign research and development work on the employment guidance model pays more attention, is more mature in theory, and the guidance model and implementation methods are under construction [14]. The employment system for college graduates in the United States can be summarized as follows: the government does not guarantee the assignment, the school guides the service, and the graduates choose their own careers. Due to the need for competition, each school strives to make its graduates find good careers and increase the employment rate of graduates as a way to improve the status, popularity, and influence of the school [15]. This leads to more recognition and support from all sectors of society and attracts more talented students to apply. Regarding the practical aspect of employment guidance, colleges and universities generally implement a system of free employment for college students. The school is not responsible for the employment of college students, but the employment work is related to the effectiveness of the school, so the school attaches great importance to the employment guidance work [16]. The foreign employment model is all around and three dimensional, and the services are rich and detailed. However, it also has its limitations, such as a lack of systematic value orientation, generally not evaluating the values held by students in employment guidance, paying too much attention to the development of self, and ignoring social needs [17].

2.2. Current Status of Research on Career Planning. Most of the time of human life is spent in a career, and the success of a career is directly related to the quality of life. At present, although the career guidance work of college students has been fully developed, there are still many problems [18]. Among them, the most prominent one is the lack of theoretical research on the current career planning of college students, and the lack of rational thinking and long-term vision for the career development of college students. Career planning and career development education are still new in
China, and the practice of using career planning and career development education theory to guide college students’ employment is still in the initial stage [19]. According to the relevant survey, only a few colleges and universities have started to provide career planning and career development education to college students. The fundamental purpose of studying university career planning and career development education is to improve the education mode of university career planning and career development in China’s colleges and universities, to help college students establish correct career values, to comprehensively improve students’ comprehensive quality, and to make it the driving force of college student’s growth and success [20]. The summary of research on career planning is shown in Figure 2.

The domestic research on university career planning and career development education has achieved fruitful results and produced a series of influential works and studies. There are three main types of research ideas on university career planning and career development education in domestic academia [21]. First is the research and introduction of foreign career guidance theories and their practices. Second is the research and exploration of university career planning and career development education model. Third is the research on the construction of university career planning and career development education curriculum [22]. Foreign research on career education focuses on the uniqueness of the individual, emphasizes the development and realization of the individual, revolves around the overall development of the person, and takes the interaction between the person and the environment as the method and means of rational career education.

2.3. The Current State of Research in Association Analysis. The expression, strength, derivation mechanism, and potential implications of interactions between choice elements are all reflected in the type of connection. By sorting out the relevant results of association-based choice analysis research [23], the normal division of association kinds of decision elements is described, and the trends offered by this research are condensed. There is an imbalanced quantitative distribution. The programmatic association type has the greatest research outcomes, whereas the target association type has the fewest. The temporal distribution appears to be erratic. The studies of programmer association types indicate a noticeable jump, but the studies of goal and decision-maker association types show a strong continuity [24]. The classification of attribute association types is mainly based on the potential consequences of the association, the presentation, and the reciprocity of the interaction. The perspectives of association types are more diverse and most detailed [25]. Some scholars intuitively take the perspective of validity, relevance, strength, and presentation as the entry point. Other scholars start from the derivation mechanism to explore the multi-dimensional classification characteristics of program associations [26]. The classification of target association types is a relatively single perspective, mainly focusing on the synergistic and conflicting relationships of associations; the classification of decision-maker association types is mainly based on the potential consequences, derivative mechanisms, and synergistic and conflicting relationships of associations [27]. The general steps of association analysis are shown in Figure 3.

Association information is a data carrier reflecting the type or strength of association between elements in the set to which the decision elements belong. Taking the three levels of access, presentation, and quantitative scale as the entry point, we systematically sort out and compare the relevant results, and then summarize the research trends and typical characteristics of correlation information [28]. In today’s information age, the sources of correlation information are becoming more and more extensive, involving historical data information accumulated over a certain period of time, simulation information obtained with the help of tools, real-time dynamic information, etc. Scholars have combined the characteristics of multiple sources to obtain correlation information in single or multiple ways [29]. Scholars combine the characteristics of multiple sources of information to flexibly choose a single way or a combination of ways to obtain correlated information. Goal association refers to the interrelationship between several goals that the decision analysis expects to achieve. Decision-maker association refers to the interrelationship between decision-makers’ behaviors or preferences, and the decision-makers involved may be experts with a dynamic nature [30, 31].

3. Design of the Application Method

This chapter introduces the evaluation method based on improved correlation analysis, first introducing the superiority and rationality analysis of method fusion, then introducing the steps of improved hierarchical analysis method of gray correlation model, and finally introducing the posterior assignment method based on correlation degree assignment.
3.1. Analysis of Superiority and Rationality of Method Fusion. The system can be presented in the form of a hierarchical structure, and the hierarchical analysis is conceptually straightforward and unambiguous. It also provides the benefits of both qualitative and quantitative analysis, low sample data requirement, and the ability to objectively quantify the weight of each risk factor. Multifactor, multi-level, and multiprogram risk evaluation tasks are all possible with this tool. The consistency test in the AHP can use algebraic tools to check whether the experts’ thinking is consistent and contains a profound decision utility mechanism, which ensures the consistency of experts’ thinking logic in the investigation process and guarantees the consistency of group decisions. However, the two-by-two comparison method in the hierarchical analysis is very tedious when there are many factors to analyze. Such a tedious comparison process is likely to cause boredom among experts in engineering practice, leading to distortion in subsequent evaluations, which directly affects the accuracy of the evaluation results. The two-by-two comparison between risk factors is essentially a substitution of ideology for objective probability and is influenced by experience, learning, and cognition that can bring in a certain amount of subjectivity. When the degree of contradiction cumulatively exceeds the requirement of generalized consistency, it will lead to the unsatisfied consistency of the judgment matrix.

Some researchers made enhancements to the hierarchical analysis approach while using it to solve the limitations of the AHP. The gray system theory is a significant disciplinary theory in the field of systems engineering in China, with widespread acceptance in management. Correlation analysis can serialize the ambiguous gray relations of the system and make the gray relations white. The gray correlation analysis requires little sample data and is especially suitable for the analysis of complex and unclear intrinsic relationships of the system. Its essence lies in judging the degree of correlation by geometric processing and comparing the degree of similarity of serial curves, which makes up for the defects of mathematical and statistical methods. In the analytical model, if two factors have a high degree of correlation, it means that they have the same trend and are relatively closely related to each other, and the higher the correlation, the higher the degree of similarity. On another level, a higher correlation means that the risk causing of one risk factor is also more relevant to the other factor or its parent total risk. The gray correlation analysis can establish the overall comparison mechanism of factors, analyze the factors in the system as a whole, and clearly explore the degree of correlation of the system without the need for a large amount of data and without the requirement for the pattern and distribution of data, which is the main reason for the wide range of application of the gray correlation analysis.

3.2. Improved Analytic Hierarchy Process Based on the Gray Correlation Model. The gray correlation model and hierarchical analysis of the progressive hierarchy evaluation system, although different in form, but in the specific expression of the same, the AHP progressive hierarchy can be the qualitative and quantitative expressions of the factors in the system, and, therefore, the construction of a progressive hierarchy of evaluation index system for identification and analysis. The technique and processes of the enhanced analysis approach are detailed in the following section by developing a single ranking assessment model, as illustrated in Figure 4.
First, after the identification work is completed, the model to be evaluated is constructed as a recursive hierarchical archicalevaluationmodel.Subsequently,thefactorswithinalayerandthetotalfactorsintheupperlayerwereevaluatedbyexperts,andscoreswereperformedona0–1scalebecausethegrayscalecorrelationmodelwaspertformedfirst,withasmallerscalevalueindicatingahigh-riskfactorandalarger-scalevalueindicatingalow-riskfactor.

Takingthescoringsituationofthisthreevelsandthescoringsituationofthetotalriskofthepreviouslevel,sothatthenumberofexpertsandsequencestobevaluatedismeasuredasthenumberoffactorstobeevaluatedis determinedastastandardreferenceserieswiththefollowing mathematical expressions.

\[
X_m(k) = [x_m(1), x_m(2), \ldots, x_m(n)]^T.
\]  

(1)

Theevaluationdataoftheupper-leveltotalriskaredeterminedasastandardreferenceserieswiththefollowing mathematical expressions.

\[
X_0(k) = [x_0(1), x_0(2), \ldots, x_0(n)].
\]  

(2)

Theseriesetobeevaluatedareformedbycolumnsintothematrixtobeanalyzedofthegrayscalecorrelationmodelwiththefollowing mathematical expressions.

\[
X_i(k) = (X_1, X_2, \ldots, X_m) = \begin{pmatrix}
x_1(1) & x_2(1) & \cdots & x_m(1) \\
x_1(2) & x_2(2) & \cdots & x_m(2) \\
\vdots & \vdots & \ddots & \vdots \\
x_1(n) & x_2(n) & \cdots & x_m(n)
\end{pmatrix}.
\]  

(3)

Thesequenceprimingisthenperformed,andthemathematicalexpressionisasfollows:

\[
X'_i(k) = \frac{X_i(k)}{X'_0(k)}
\]  

(4)

Thestandardreferencematrixisthenprimed,thetimetheoriginalmatrixtobeanalyzedisprimed,andthepriming resultsareshowninthefollowingequation.

\[
X'_i(k) = (X'_1, X'_2, \ldots, X'_m) = \begin{pmatrix}
x'_1(1) & x'_2(1) & \cdots & x'_m(1) \\
x'_1(2) & x'_2(2) & \cdots & x'_m(2) \\
\vdots & \vdots & \ddots & \vdots \\
x'_1(n) & x'_2(n) & \cdots & x'_m(n)
\end{pmatrix}.
\]  

(5)

Then,theadbsolutedifferenceoperationisperformedtoobtaintheadbsolute difference matrix,whose mathematical expressionisasfollows:

\[
\Delta_i(k) = |X'_i(k) - X'_0(k)|.
\]  

(6)

Themathematicalexpressionoftheadbsolute difference matrixofthesamedimensionasthematrixtobeevaluatediscalculatedbytheaboveequationinterturn.
The matrix to be analyzed is then primed.

\[
X'_i = (\omega'_1, \omega'_2, \ldots, \omega'_m)^T = \begin{bmatrix}
\omega'_1(1) & \omega'_1(2) & \cdots & \omega'_1(n) \\
\omega'_2(1) & \omega'_2(2) & \cdots & \omega'_2(n) \\
\vdots & \vdots & \ddots & \vdots \\
\omega'_m(1) & \omega'_m(2) & \cdots & \omega'_m(n)
\end{bmatrix}
\]  \hspace{1cm} (9)

The absolute difference matrix is obtained by applying the absolute difference formula, and the maximum and minimum extreme values are extracted from the matrix.

\[
\Delta_i = \begin{bmatrix}
\delta_1(1) & \delta_1(2) & \cdots & \delta_1(n) \\
\delta_2(1) & \delta_2(2) & \cdots & \delta_2(n) \\
\vdots & \vdots & \ddots & \vdots \\
\delta_m(1) & \delta_m(2) & \cdots & \delta_m(n)
\end{bmatrix}
\]  \hspace{1cm} (11)

Dunn’s correlation of the weight value vector is calculated, and the expert weights are determined according to the correlation ratio.

\[
\omega'_m = \frac{R_i}{\sum_{i=1}^{m} R_i}
\]  \hspace{1cm} (12)

The factor weights of each expert at different levels are assigned with expert weight values, which are used as the final risk factor weight values. The running steps of the posterior assignment method based on correlation degree assignment are shown in Figure 5.

4. Experiments and Results

The growth of colleges and universities has slowed in recent years, and the focus of national attention on colleges and universities has shifted from increasing the number of students to improving the quality of student training. As a result, the issue of college graduates' employment quality has gotten a lot of attention and focus in China. This study takes the graduation destination and salary level as the measurement index of employment quality, based on the two contradictions of data storage and utilization and university, student demand, and data supply, and uses the data related to graduates from the School of Management and the School of Economics collected from the Academic Affairs Office, Student Affairs Office, Career Guidance Center, and College of University A to integrate and mine the data from multiple departments in a data mining way. The rules and circumstances of the study subjects are shown in Table 1.

After the factors affecting employment quality are identified through feature selection tests, the employment quality prediction model is started. This study uses an improved correlation analysis algorithm for prediction. The generated model has rule sets, and hence this study is to organize, analyze, and evaluate the extracted rules based on different types of employment quality. As a result, the rule set was picked to construct the model. In addition, strategies such as group symbols were used in this study to improve the
model’s accuracy. Many factors have varying degrees of influence on where graduates go after graduation. Based on the results of data mining, we examine the importance of factors influencing graduation destination in this research. The next stage is to look at the group characteristics of various graduation destinations. In order to ensure the accuracy and applicability of the extracted features, this study only collates, analyzes, and evaluates the rules with a sample size of more than 45 and a confidence level close to or above 0.7.

Looking at the 8 rule sets, it can be seen that 7 rule sets relate to the type of internship units of graduates, 6 rule sets relate to GPA ranking and college, and 5 rule sets relate to student leaders, grade 4 and 6 scores, and participation in innovative and entrepreneurial activities. After the model is constructed, it needs to be checked whether its accuracy meets the requirements. Using the data from the randomly selected test set in the previous section, we can evaluate the accuracy and applicability of the model. The correct rate of model prediction classification is shown in Table 2 and Figure 6.

Table 1: The rules and circumstances of the study subjects.

<table>
<thead>
<tr>
<th>Sample set</th>
<th>Sample</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule set 1</td>
<td>109</td>
<td>0.991</td>
</tr>
<tr>
<td>Rule set 2</td>
<td>105</td>
<td>0.991</td>
</tr>
<tr>
<td>Rule set 3</td>
<td>047</td>
<td>0.978</td>
</tr>
<tr>
<td>Rule set 4</td>
<td>062</td>
<td>0.875</td>
</tr>
</tbody>
</table>

Table 2: Correctness of model graduation destination prediction.

<table>
<thead>
<tr>
<th>Sample set</th>
<th>Number of samples</th>
<th>Correct number of samples</th>
<th>Correct rate</th>
<th>Number of error samples</th>
<th>Error rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training set</td>
<td>2332</td>
<td>2043</td>
<td>87.61%</td>
<td>289</td>
<td>12.39%</td>
</tr>
<tr>
<td>Test set</td>
<td>1074</td>
<td>0881</td>
<td>82.03%</td>
<td>193</td>
<td>17.97%</td>
</tr>
</tbody>
</table>

Figure 5: Steps of running a posteriori assignment method based on correlation degree assignment.

Figure 6: Evaluation performance of the model.
It can be seen that the correct prediction rate of the training set is 87.61%; the correct rate of the test set is 82.03%. Both have a higher correct rate of predicting graduation destination. Performance ratings are used to consider the difficulty of different categories in the classification problem. Rare categories receive higher performance ratings, and if the category of the model is not better than the random prediction, the performance rating of the category is 0. All four categories of this study model’s performance assessment indices are between 1.1 and 1.3, showing that the model is valid and the performance evaluation indices are relatively close, indicating that the sample size of each category is similar, avoiding sample imbalance. In terms of confidence, all of the rules sets generated by the model have confidence values above 0.204. The average confidence level for samples that were successfully identified was 0.443, while the average confidence level for those that were incorrectly classified was 0.363. The prediction accuracy of each classification of salary grade is shown in Table 3 and Figure 7.

The model pay grade prediction results can be obtained as 67.62% accuracy for high pay, 94.29% accuracy for medium pay, and 67.31% accuracy for low pay. It can be seen that the accuracy rate of pay grade has some fluctuation, and the accuracy rate of prediction for medium pay is the highest, which is over 94%.

5. Conclusions

University career planning and development education are the result of long-term social growth and the unavoidable consequence of rapid socioeconomic development. University career planning and career development education are a purposeful, opportunistic, and organized activity aimed at increasing individuals’ awareness and skills in career planning, developing college students’ comprehensive vocational abilities, promoting individual career development, and guiding college students to use career planning and career development as the main line of comprehensive education and learning. The study of college career planning and career development education can effectively solve the existing problems of college students’ career planning education. Establishing a comprehensive and systematic college career planning and career development education system will make the college career education counseling organization more perfect and functional. This study begins by examining the current state of university career planning and development education in depth, based on theories of each step of career planning and development education growth. Then, using better correlation analysis, this research provides a method for evaluating employment knowledge and career planning, and the experimental results show that the suggested method can accurately assess the influence of employment counseling. Scientific career planning must break the hold of the traditional view of success and has a lot to do with family influence; at the same time, career guidance is very practical and inseparable from industry cognition, so schools should take advantage of families and enterprises to jointly promote career guidance for high school students. The most significant assistance for their children to grasp the necessity of career planning and to plan a suitable further education or work is their parents’ active advice.

Data Availability

The datasets used during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References


