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RESEARCH ARTICLE

AN EMPIRICAL ANALYSIS OF THE FACTORS INFLUENCING THE EMPLOYMENT WILLINGNESS OF VOCATIONAL COLLEGE GRADUATES BASED ON THE MLR MODEL A CASE STUDY OF 49 VOCATIONAL COLLEGES IN ZHEJIANG PROVINCE

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Abstract

This study empirically analyzes the factors influencing the employment willingness of vocational college graduates in Zhejiang Province, using graduates from 49 vocational colleges as the survey group. The analysis is based on four aspects: social factors, school education, family beliefs, and personal abilities. The research findings indicate that personal abilities and social factors have a significant positive impact on the employment willingness of vocational college graduates, while school education and family beliefs also positively influence their employment willingness. Therefore, it is recommended to enhance individuals' core competitiveness, establish employment-related policies for graduates at the societal level, provide targeted employment guidance for graduates at schools, and promote the development of sound career selection concepts within families.

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Introduction:-

With the rapid development of China's economic conditions and the popularization of higher education, the number of university graduates has been continuously increasing. By 2022, the number of college graduates exceeded 10 million, reaching 10.76 million. As the number of college graduates continues to rise, the employment situation has become increasingly severe, and the employment willingness of graduates has also changed. The employment willingness of college graduates is influenced by various factors, including social, educational, family, and personal aspects. This study intends to use regression analysis to examine the factors influencing the employment willingness of vocational college graduates, taking graduates from 49 vocational colleges in Zhejiang Province as a case study. The analysis will focus on four aspects: social factors, school education, family beliefs, and personal abilities, in order to explore the primary factors affecting the employment willingness of vocational college graduates, and to propose targeted recommendations and strategies.

Theoretical Analysis and Reliability and Validity Analysis

Analysis of Factors Influencing the Employment Willingness of Vocational College Graduates

Both domestic and international literature have conducted in-depth discussions on the employment willingness of college graduates, accumulating a substantial body of research findings. According to previous studies, willingness is a subjective concept characterized by complexity and dynamism, and is influenced by various factors, both subjective and objective. Therefore, based on the literature research from both domestic and international sources, as well as questionnaire surveys and student interviews, this study

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identifies the influence level of social factors, school education, family beliefs, and personal abilities, with a total of 16 variables.

Reliability and Validity Analysis

A total of 2,207 questionnaires were collected in this survey, with 1,674 valid responses, resulting in an effective response rate of 75.85%. Among these, 569 paper questionnaires and 1,105 electronic questionnaires were returned. Reliability and validity tests were conducted on the survey sample. The reliability analysis results of the questionnaire are shown in Table 1. By calculating the Cronbach's internal consistency coefficient, we found that $\alpha = 0.976 > 0.9$, indicating that the internal consistency reliability of this scale is very high, and its reliability meets the requirements for subsequent research.

Table 1: - Consistency α Coefficient Values.

| Cronbach's Alpha | Number of Items |
|------------------|-----------------|
| .976 | 16 |

A validity test was conducted on the survey sample, and the validity analysis results are shown in Table 2. The KMO value is 0.925, and $p = 0.000 < 0.05$, indicating that there is a correlation between the data, which demonstrates good discriminant validity.

Table 2: - KMO and Bartlett's Test for the Pre-Survey.

| | | |
|---|------------------------|----------|
| Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy | .925 | |
| Bartlett's Test of Sphericity | Approximate Chi-Square | 1529.269 |
| | df | 3 |
| | Sig. | .000 |

Data Analysis of Factors Affecting Employment Willingness

Research Hypotheses

In studies on the factors influencing employment willingness, foreign scholars generally argue that the graduates' own career orientation and job-seeking expectations are the primary reasons affecting their employment willingness. Piao's labor market stratification theory attributes the difficulty of college graduate employment to the graduates themselves. Facing unemployment in a developed labor market, they are reluctant to work in lower-level labor markets^[1]. Zhang Shengyang (2022), combining the Theory of Planned Behavior with Social Capital Theory, constructed a structural equation model to explore the impact of social capital on the employment willingness of college graduates. The results showed that social capital has a significant effect on employment willingness^[5]. Zhang Jizhen and Wang Longmiao (2023), using data from nine universities in Xinjiang, found that human capital is the most significant factor influencing the employment of ethnic minority graduates^[2].

Therefore, scholars generally agree that employment willingness is influenced not only by objective factors such as society, family, and school education, but also by the graduates' own subjective factors^[1]. By analyzing the comprehensive impact of social factors, school education, family beliefs, and personal abilities on the employment willingness of vocational college graduates, this study proposes the following hypotheses:

H1: Social factors have a positive impact on the employment willingness of vocational college graduates.

H1a: Educational requirements have a positive impact on the employment willingness of vocational college graduates.

H1b: The supply and demand in the job market have a positive impact on the employment willingness of vocational college graduates.

H2: School education has a positive impact on the employment willingness of vocational college graduates.

H2a: Employment guidance at schools has a positive impact on the employment willingness of vocational college graduates.

H2b: The employment atmosphere at school has a positive impact on the employment willingness of vocational college graduates.

H3: Family beliefs have a negative impact on the employment willingness of vocational college graduates.

H3a: The economic foundation of the family has a negative impact on the employment willingness of vocational college graduates.

H3b: The family's employment concept has a negative impact on the employment willingness of vocational college graduates.

H4: Personal abilities have a positive impact on the employment willingness of vocational college graduates.

H4a: Personal competitiveness has a positive impact on the employment willingness of vocational college graduates.

H4b: Career planning has a positive impact on the employment willingness of vocational college graduates.

Random Forest Feature Importance Analysis

Feature importance is a method for scoring the input features of a predictive model, revealing the relative importance of each feature in the prediction process. Bagging decision trees, such as Random Forest, can be used to estimate the importance of features. Features with low scores are removed, and those with high scores are retained, achieving the goal of feature selection. Random Forest is essentially an algorithm that combines the Bagging theory with the Random Subspace method. In Random Forest, both the feature values and the training samples are sampled. This method effectively ensures the independence of the decision trees constructed, making the final voting output more reliable [7].

In this survey, an analysis of the factors influencing the employment willingness of vocational college graduates was conducted. We selected eight indicators that impact the employment willingness of vocational college graduates—educational requirements, market supply and demand, school employment guidance, school employment atmosphere, family economic foundation, family employment beliefs, personal competitiveness, and career planning—as the input feature set for the Random Forest algorithm. Feature importance ranking was performed to obtain the importance ranking values of these eight factors, as shown in Table 3.

Table 3:- 8-Dimensional Input Features.

| Category | No. | Educational Requirements | Category | No. | Specific Factor Indicator |
|----------------|-----|--------------------------|------------------|-----|---------------------------------|
| Social Factors | 1 | Educational Requirements | School Education | 3 | Employment Guidance at School |
| | 2 | Supply and Demand | | 4 | Employment Atmosphere at School |
| Social | 5 | Family Economic | Personal | 7 | Personal |

| | | | | | |
|---------|---|---------------------------|-----------|---|-----------------|
| Factors | 6 | Foundation | Abilities | 8 | Competitiveness |
| | | Family Employment Beliefs | | | Career Planning |

In the learning process, model parameter tuning can effectively improve the model's final performance and its generalization ability.

This study uses a data search approach, where each possible parameter within a specified range is iteratively tested to find the best-performing parameters as the final result. The optimization and parameter tuning process for the Random Forest model is shown in Table 4.

Table 4:- Random Forest Parameter Tuning Process.

| Parameter Name | Initial | Tuning | Optimized | MSE Under | MSE After |
|----------------|---------|--------|-----------|------------|-----------|
| | Value | Range | Result | Original | |
| | | | | Parameters | Tuning |

| | | | | | |
|-------------------|------|---------|----|-------|-------|
| n_estimator | 10 | [10.40] | 40 | | |
| max_depth | 40 | [40.70] | 50 | | |
| min_samples_split | 6 | [6.10] | 8 | 1.001 | 0.790 |
| min_samples_leaf | 1 | [1.3] | 1 | | |
| max_features | sqrt | [8.12] | 11 | | |

Based on the parameter tuning results from the above model, the corresponding feature importance calculated by the Random Forest model is obtained. The following are the feature selection results for the 8 factors influencing the employment willingness of vocational college graduates, as shown in Table 5:

Table 5:- Feature Importance Solved by Random Forest.

| Influencing Factor | Category | Feature Importance | Final Ranking |
|---------------------------------|------------------|--------------------|---------------|
| Educational Requirements | Social Factors | 0.0369 | 2 |
| Employment Atmosphere | Social Factors | 0.0288 | 6 |
| Employment Atmosphere at School | School Education | 0.0314 | 7 |
| Employment | School | 0.0307 | 8 |

| | | | |
|----------------------------|--------------------|--------|---|
| Guidance at School | Education | | |
| Family Economic Foundation | Family Beliefs | 0.0285 | 4 |
| Family Employment Beliefs | Family Beliefs | 0.0214 | 5 |
| Career Planning | Personal Abilities | 0.0382 | 1 |
| Personal Competitiveness | Personal Abilities | 0.0367 | 3 |

In this survey sample, Career Planning has the highest feature importance ranking at 3.82%, while Family Employment Beliefs has the lowest ranking at 2.14%. This indirectly indicates that the most significant factor influencing the employment willingness of vocational college graduates is their appropriate career planning. In contrast, their family's employment beliefs show the most negative emotional perception.

MLR Model Analysis

The MLR model, also known as the Multiple Linear Regression model, is a statistical analysis method used to determine the quant

itative relationship between two or more interdependent variables. The goodness-of-fit result of the regression model reflects how well the regression equation fits the data. R² is the coefficient of determination for the entire model, with values ranging from 0 to 1. The higher the R² value, the better the fit of the regression model, meaning the independent variables explain a higher proportion of the variance in the dependent variable. In the regression results of the dependent and independent variables in this study, the R² value is 0.765, indicating that the four independent variables in this regression equation explain 76.5% of the dependent variable, which is user engagement. The adjusted R² is also 0.765, showing that the difference is not large, meaning the regression equation provides a reasonable explanation for the dependent variable^[9]. Based on the above theory, the regression results for the factors influencing the employment willingness of vocational college graduates are shown in Table 6.

Table 6:- Goodness-of-Fit Results.

| Model | R | R ² | Adjusted R ² | Standard Error of Estimate | Change Statistics | | | | |
|-------|---|----------------|-------------------------|----------------------------|-------------------|----------|-----|-----|---------------|
| | | | | | R-Squared Change | F Change | df1 | df2 | Sig. F Change |
| | | | | | | | | | |

| | | | | | | | | | |
|---|-------------------|------|------|------|------|----------|---|------|------|
| 1 | .875 ^a | .765 | .765 | .208 | .765 | 1464.023 | 3 | 1348 | .000 |
|---|-------------------|------|------|------|------|----------|---|------|------|

a. Predictors: (Constant) Social Factors, School Education, Family Beliefs, Personal Abilities

b. Dependent Variable: Employment Willingness of Vocational College Graduates

We conducted a regression analysis on the various factors influencing the employment willingness of vocational college graduates and performed a significance test on the resulting regression equation using the F-value test. When the F-value is significant (i.e., the Sig value is less than 0.05), the regression equation is considered significant. As shown in Table 7, the F-value of this regression equation is 1464.023, with a significance level of $p=0.000 < 0.05$. This indicates that the regression analysis is statistically significant and demonstrates that the regression equation is of practical relevance [9].

Table 7:- Significance Analysis.

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|------|-------------|----------|--------------------|
| 1 | Regression | 190.086 | 3 | 63.362 | 1464.023 | 0.000 ^b |
| | Residual | 58.340 | 1348 | 0.043 | | |
| | Total | 248.426 | 1351 | | | |

a. Predictors: Employment Willingness of Vocational College Graduates

b. Dependent Variable: (Constant) Social Factors, School Education, Family Beliefs, Personal Abilities

We performed a regression analysis on the factors influencing the employment willingness of vocational college graduates and conducted a significance test on the resulting regression equation using the F-test. The F-value test method is used, where the regression equation is considered significant when the F-value is significant (Sig-value is less than 0.05). As shown in Table 7, the F-value for this regression equation is 1464.023, with a significance level of $p=0.000 < 0.05$. This indicates that, through the significance test, the regression analysis is statistically significant and the equation holds practical relevance. The main indicators for detecting multicollinearity are tolerance and Variance Inflation Factor (VIF). Tolerance refers to the reciprocal of VIF. In this regression analysis, the tolerance for School Education is 0.107, and $VIF=9.344$; for Social Factors, tolerance is 0.206, and $VIF=4.861$; for Personal Traits, tolerance is 0.187, and $VIF=9.464$; for Family Attributes, tolerance is 0.179, and $VIF=5.461$. Since the tolerance values for all four factors are greater than 0.1, and the VIF values are all less than 10, it can be concluded that there is no significant multicollinearity problem among the four independent variables in this regression model.

The main purpose of the regression coefficient significance test is to check whether the regression coefficients for each factor are significant, and the significance level is assessed using the t-test. As shown in Table 8, the significance levels (Sig values) of the t-test for Social Factors, School Education, Family Beliefs, and Personal Abilities, as well as the constant term, are all less than 0.05. Therefore, these independent variables and the constant term can all be included in the regression equation influencing the employment willingness of vocational college graduates [9].

Table 8:- Multicollinearity and Regression Coefficient Significance Test.

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Correlation | | | Collinearity Statistics | |
|-------|-----------------------------|----------------|---------------------------|---|------|-------------|---------|---------|-------------------------|-----|
| | B | Standard Error | Standard Error | | | Zero-order | Partial | Partial | Tolerance | VIF |
| | | | | | | | | | | |

| | | | | | | | | | | | |
|---|--------------------|-------|------|-------|---------|------|-------|-------|-------|------|-------|
| 1 | (Constant) | 1.822 | .010 | | 174.947 | .000 | | | | | |
| | School Education | -.245 | .013 | -.733 | -18.164 | .000 | -.871 | -.443 | -.240 | .107 | 9.344 |
| | Social Factors | -.055 | .011 | -.151 | -5.174 | .000 | -.790 | -.140 | -.068 | .206 | 4.861 |
| | Personal Abilities | -.003 | .016 | -.009 | -3.207 | .036 | -.835 | -.006 | -.003 | .187 | 9.464 |
| | Family Beliefs | -.155 | .012 | -.651 | -15.174 | .000 | -.890 | -.340 | -.268 | .179 | 5.461 |

a. Dependent Variable: Employment Willingness of Vocational College Graduates

Based on Table 8, the regression equation for the factors influencing the employment willingness of vocational college graduates is: $Y = 1.822 + (-0.245) X_1 + (-0.055) X_2 + (-0.003) X_3 + (-0.155) X_4$

Where X_1, X_2, X_3, X_4 are the independent variables, and Y is the dependent variable. The multiple correlation coefficient between X_1, X_2, X_3, X_4 and Y is $R = 0.765$. The F -test value for the regression equation is 1464.023, with a significance probability of 0.000 ($p < 0.005$), indicating that the linear regression equation is statistically significant. From the regression equation, it can be seen that the four dimensions affect the employment willingness of vocational college graduates to varying degrees. The factors are ranked by their influence as follows: $X_3 > X_2 > X_4 > X_1$, meaning Personal Traits > Social Factors > School Education > Family Attributes.

Conclusion:-

The MLR model leads to the conclusion that, among the factors influencing the employment willingness of vocational college graduates: The standardized coefficient for the influence of social factors is -5.174, indicating a negative influence of social factors on the employment willingness of vocational graduates, thus confirming H1.

The standardized coefficient for the influence of school education is -18.164, indicating a negative influence of school education on the employment willingness of vocational graduates, thus confirming H2.

The standardized coefficient for the influence of family beliefs is -15.174, indicating a negative influence of family beliefs on the employment willingness of vocational graduates, thus confirming H3.

The standardized coefficient for the influence of personal abilities is -3.207, indicating a positive influence of personal abilities on the employment willingness of vocational graduates, thus confirming H4.

MLR Model Results Analysis

Social Factors

The degree of influence of social factors has a positive impact on the employment willingness of vocational college graduates. This suggests that issues such as an imbalanced supply and demand in the employment market, national support for graduates to start their own businesses or join the military, and companies' preference for hiring employees with higher education levels, lead to an unfair and irregular employment environment in society.

School Education

The degree of influence of school education has a positive impact on the employment willingness of vocational college graduates. This indicates that schools face challenges such as a lack of a dynamic employment atmosphere, generalized employment guidance that is not tailored to individual needs, and limited employment opportunities in the region where the school is located, which results in a lack of targeted employment services and guidance.

Family Beliefs

The degree of influence of family beliefs has a positive impact on the employment willingness of vocational college graduates. This implies that factors such as a strong family economic foundation, deeply ingrained family employment beliefs, and the support from families and parents to delay employment lead to an inappropriate family intervention and outdated family education concepts.

Personal Traits

The degree of influence of personal traits has a positive impact on the employment willingness of vocational college graduates. This suggests that vocational graduates may lack core competitiveness in job hunting, have unclear personal career planning, and hold high employment expectations, leading to an unclear career orientation and insufficient internal motivation to seek employment.

Research Conclusions and Recommendations Based on the MLR Model**Social Factors:**

Improve Employment Security System and Standardize

Legal Regulations

Government departments should promptly introduce policies related to university graduates and corresponding countermeasures, further improving the employment security system, optimizing the allocation of vocational education resources, and creating a fair and harmonious employment environment. At the same time, the concept of employment should shift away from solely judging talent by academic qualifications, increasing the employment enthusiasm of vocational graduates, and ensuring that graduates from vocational colleges are able to enter the workforce, helping them develop in a healthy, stable, and harmonious manner across various industries and levels.

School Education:**Increase Employment Concept Education and Offer Integrated Theory-Application Courses**

Vocational colleges should add a public foundation course on employment to their curricula, strengthen teaching in fundamental courses, update educational concepts, and improve teaching methods. In the teaching of public and professional foundation courses, the approach should connect theory to practice. Higher vocational education aims to cultivate high-quality, high-skilled applied talents, which is a key focus of vocational technical colleges. By combining theory with practice, vocational colleges can create abundant practical opportunities for graduates.

Family Beliefs:**Improve Family Education and Optimize Family Employment Guidance**

Families should actively cooperate with society and schools to establish effective employment coordination mechanisms, ensuring that vocational graduates can fully leverage their advantages. Family education campaigns should be strengthened to improve parents' education, guidance, and services, fostering a greater sense of responsibility in the family. Parents should not only improve their own cultural literacy and abilities but also lead by example. Employment guidance in the family should be based on the relevant skills and capabilities provided by the school, actively participating in family education guidance, and enhancing reasonable education at home. This approach will help parents make informed career choices, better guiding students in their job search.

Personal Abilities:**Analyze Employment Situation and Adjust Personal Development Expectations**

When seeking employment, vocational graduates should conduct an objective analysis of the current job market. They should not adopt a passive attitude toward choosing their employment situation but should continuously adjust their employment requirements

sedoncurrentmarketconditions. It is important to scientifically and reasonably assesspersonal abilities and professional qualities, taking into accountfactors suchastheworkenvironment,conditions,andbenefits,aswellas personal career interests, abilities, and development prospects.Graduates should appropriately lower their expectations, avoiding theblind pursuit of high salaries or easy jobs. The importance of careerdevelopment in personal growth and development should be emphasized,without overemphasizing the relationship between different jobs.

Conclusion:-

Vocational college graduates, as a high-level workforce in the labor market, play a crucial role in ensuring the livelihood of the population, maintaining the vitality of the labor market, and contributing to the positive economic development. Achieving high-quality employment for vocational graduates is of significant practical importance. To ensure the successful employment of these graduates, it requires the collective efforts of society, schools, families, and individuals. By working together, we can help vocational graduate transitions smoothly into the workforce.

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