Article

Quality management model of Chinese higher vocational graduates in Yunnan province

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Abstract: China's graduate quality management system is designed to ensure that students possess the necessary skills, knowledge, and competencies for future success. This system is rooted in China's ambitious educational reforms aimed at cultivating a highly skilled workforce to drive economic growth and innovation. Effective graduate quality management significantly impacts employment levels, training models, and national policy formulation. This study investigates the quality management approaches of 56 vocational institutions in Yunnan Province using a 5-level questionnaire and a quantitative research methodology. A sample of 556 individuals was selected through stratified random sampling. Exploratory factor analysis identified five primary components of the quality management model: College graduate quality (mean = 4.56, SD = 0.49), teaching quality (mean = 4.39, SD = 0.42), hardware environment (mean = 4.38, SD = 0.44), social support (mean = 4.37, SD = 0.42), and job satisfaction (mean = 4.38, SD = 0.42). College graduate quality and teaching quality were the most influential factors, while hardware environment, social support, and job satisfaction had lesser impacts.

Keywords: quality management model; exploratory factor analysis; higher vocational colleges; influencing factors; Yunnan province

1. Introduction

The quality of graduates from higher vocational colleges is a multidimensional concept that encompasses technical competence, soft skills, employability, and adaptability to industry trends. The effectiveness of higher vocational education depends on aligning curricula and teaching methods with the needs of industries and employers. As China transitions toward an innovation-driven economy, the role of higher vocational institutions in producing graduates who contribute to technological advancement and economic growth becomes increasingly crucial.

Existing literature on higher vocational education in China primarily focuses on enrollment rates, curriculum development, teaching methodologies, and employability outcomes. However, there is a notable gap in research on comprehensive quality management strategies that address the multifaceted nature of graduates' readiness for the workforce. Additionally, the influence of individual, institutional, corporate, and government factors on quality management practices in Chinese higher vocational institutions remains relatively unexplored.

Sun et al. (2022) explored the relationship between emotional intelligence and academic stress among students at a small private college, emphasizing the importance of understanding students' emotional intelligence levels to improve retention rates. Su et al. (2024) investigated the relationship between emotional intelligence, perceived stress, and adaptability among nursing undergraduates, examining whether stress

perception mediates the relationship between emotional intelligence and adaptive ability. Tait et al. (2024) studied the relationship between emotional intelligence and academic achievement in psychology students at Bandung Islamic University, focusing on those who required more than four years to complete their studies. Guo et al. (2024) explored a moderated mediation model to understand how social and emotional skills influence student engagement. This study highlighted the importance of considering social and emotional factors in enhancing student participation in educational activities and discussed psychological well-being in Chinese university students and its relationship to student engagement. Lim et al. (2024) pointed out that the multidimensional construct of student engagement, which includes behavioral, cognitive, emotional, and social dimensions, underscores the importance of addressing emotional skills in promoting student involvement in educational practices.

Based on research on the influencing factors of quality management in higher vocational college graduates, this paper proposes countermeasures and suggestions to enhance quality management and promote the professionalization of graduates.

1.1. Research questions

(1) What are the quality management components of graduates in higher vocational colleges?

(2) What are the factors that affect the graduate's development in higher vocational colleges?

1.2. Research objectives

To investigate the quality management components of graduates.

To expound the connotation of affecting graduates' development.

2. Literature review

2.1. Study on the professional role of graduates

The job-matching concept was first introduced in 1959 by the renowned American psychologist John Holland. According to his theory, a person's career stability and success largely depend on how well their personality type matches the demands of the position. This person-job coordination (or person-job matching) theory suggests that individuals can identify the career that best fits their personality traits. College graduates, as a specific group, have distinct job requirements, procedures, and methods, and their professional tasks and work characteristics revolve around their personal development.

Graduate growth is slow and erratic, exhibiting both dominant and recessive traits. Recent college graduates must be provided with ideological and political education, which is essential at various stages and in different aspects of their development. Consequently, there are numerous standards for the competence and quality of graduates. Job matching is crucial because college graduates play a key role in fostering the next generation of leaders in the socialist cause, particularly through intellectual and political education.

Gross (2017) argued that graduates play a role in advising, enlightening, and

caring for college graduates. Beauchamp et al. (2019) contended that graduate affairs workers should be seen as "educators," responsible for graduates' development by transforming and coordinating the educational environment. Alexandra (2019) defined the management team as observers of the managerial effectiveness of graduate affairs workers, evaluating them based on their managerial competence and outcomes. She suggested that graduate affairs workers should serve in roles of "leadership," "management," "arbitration," and "education." Krieger et al. (2021) studied the effectiveness of graduate affairs workers in terms of their managerial abilities and outcomes, emphasizing the importance of their role as "guardians."

Wang et al. (2020) asserted that graduate affairs administrators' responsibilities in providing services to unique populations on college campuses should be multifaceted. According to Gil (2019), graduates have nine main duties and roles. These include offering counseling services to individual graduates or groups, assisting professional teachers in the classroom, encouraging academic development, fostering relationships between parents, schools, and teachers, guiding graduates in social practice activities and exchange visits, and responding to emergencies and crises promptly. The curriculum involves handling crises and emergencies, providing psychological support and counseling, resolving conflicts, preventing self-harm and suicide, and enhancing moral and ethical standards. Yanuardianto (2019) noted that graduate affairs management specialists play a crucial role in promoting graduate learning and are key figures in graduate affairs management organizations, as opposed to academic management organizations.

These studies demonstrate that foreign research on graduates primarily focuses on their function and framework in providing qualified counseling or guidance services for personal development. However, they have not extensively examined the graduates' capacity for mentoring or their motivational influences.

2.2. Quality management in education

The study by Madhatillah et al. (2019) aimed to determine the role of the head in implementing quality education management at SDN Gunung Keling, located in the Meureubo district of Aceh Barat regency. Additionally, it sought to identify the obstacles encountered by the principal in this endeavor. Chiappa et al. (2019) focused on examining the expansion of B-Schools in India and the resulting competitive landscape. Grosser (2019) contributed to the field by developing a systematic methodology for applying total quality management (TQM) in primary and secondary education (P&SE), which was empirically validated. Lin (2017) aimed to enhance understanding of integration processes in education by utilizing new teaching technologies and engaging in research and discussions on topics such as the history, politics, economy, and law of the European Union, along with its international relations. Min et al. (2019) explored the implementation of high-quality management education at the Islamic Religious Higher Education of Nahdlatul Ulama, also known as Perguruan Tinggi Keagamaan Islam Nahdlatul Ulama. Montani et al. (2017) addressed the quality, dilemmas, and pedagogy of ethical training and its implications for improving the caliber of management education. Foweraker et al. (2019) investigated professional engagement in managing the triad of permanent education in health, patient safety, and quality. The study involved 27 interviewees divided into

four sample groups. It examined research on graduates as clients, customer satisfaction, customer expectations, and various management theories used in higher education. Furthermore, it argued that the current criteria for assessing quality in higher education, such as meeting standards, ensuring quality control, meeting customer expectations, and assessing the cost of subpar work, do not fully align with the main objectives and metrics of quality. This paper highlighted the need to incorporate additional business concepts from Saleme et al. (2020) into higher education practices.

2.3. Quality management of vocational college graduates

The sample selection utilized purposive sampling, comprising 40 skill competencies sourced from national exam results, accreditation outcomes, vocational high school graduates' employment rates, and college enrollment statistics (Kuzminov et al., 2019). The study covered diverse themes such as the Augar Review, Teaching Excellence, Graduate Outcomes Framework, value-for-money, graduate expectations, teaching quality, assessment, digital experience, learning spaces, learning gain, university admissions, contextualized admissions, clearing, unconditional offers, degree apprenticeships, mature learners, healthcare courses, transition to university, accelerated degrees, equality and diversity, mental health and wellbeing, hate crime, sexual violence, and online harassment. Additionally, it explored responsibilities regarding graduation rates, disabled graduates' destinations, graduate wages, longitudinal educational outcomes, careers, employability, globalization, and civic responsibilities (Ju et al., 2019). Hazans (2019) focused on the gender gap in teacher training within technical and vocational education in northern Nigeria. The research design adopted a documentary approach. Wang et al. (2021) investigated the correlation between time management and academic achievement among vocational college students undergoing on-the-job training, emphasizing project planning, proposal acceptance, analysis, and problem-solving skills. Abdi (2023) conducted research across two campuses of a public TVET college in KwaZulu-Natal's northern province, while Schunk et al. (2020) focused on two campuses of a public TVET institution in the same region. The introduction of a model for academic staff promotion by Acal et al. (2020) enables the evaluation of staff competencies and their alignment with industry standards. Anchund (2021) aimed to explore College of Nursing graduates' perceptions of instruction and learning quality. Binheem et al. (2019) emphasized the importance of psychological associations and mental health theory education in enhancing graduates' mental health and cognitive abilities in higher vocational institutions. Additionally, notable contributions include those by Burford (2021).

2.4. Factors affecting quality management

Camacho et al. (2016) employed a quantitative research method in their study. Changwong et al. (2018) assessed the factors influencing the usage of management accounting in small and medium-sized businesses (SMEs) in Hanoi, Vietnam. Chinchua et al. (2022) utilized a survey as a case study and the D&MIS Success Model as a framework to investigate the variables influencing Limkokwing University of Creative Technology (LUCT) graduates' utilization of the university's portal, and

conducted a meta-synthesis of the factors influencing self-management in adolescents and young people with type 2 diabetes mellitus, employing social-ecological theory and thematic analysis technique. Sun et al. (2022) employed a qualitative technique alongside a descriptive strategy. Su et al. (2024) analyzed the big data-driven collegiate English teaching evaluation system (ET) by conducting a direct survey of 400 professors from 10 universities in Hanoi, Vietnam, and developed a theoretical framework. Guo et al. (2024) utilized regression analysis using the PLS Method to analyze a sample of 99 graduates from XYZ University's Information System Online Learning program. Ban et al. (2024) conducted a key study for undergraduate graduates, affecting its practical efficiency by multiple circumstances. Gui (2021) and Yu et al. (2021) examined various aspects influencing the quality of cadre and civil servant training and retraining, including policy institution, management, inspection, supervision, and curriculum. Understanding these elements is crucial for enhancing public service efficacy and the capacity of cadres and public servants. In a broader perspective, academic research on factors affecting graduate quality management can be categorized into subjective, objective, and social factors. Subjective factors revolve around graduates' roles, professional identity, knowledge structure, and motivation. Objective factors mainly focus on graduates themselves, while social factors encompass state regulations, social identity, and other perspectives. These studies provide a theoretical basis and framework for understanding graduate quality management.

3. Research methodology

The study was conducted using quantitative research methodology, succeeded by exploratory factor analysis (EFA).

3.1. Population and samples

Since this study is limited to higher vocational institutions in Yunnan province, a probability sampling technique is employed. As a result, researchers propose that probability sampling in quantitative data is appropriate when there is a high degree of generalization (Sekaran et al., 2000). 833 teachers and administrators from 52 core colleges participated in the study. The 468 participants in the study were chosen using basic random sample techniques and stratified selection strategies. The sample collection is displayed in **Table 1**.

Table 1. Sample collection.

Colleges Name	Type of Colleges	Size of Colleges	Number of teachers	The sample size for the assessment	Numbers of Sample
Qujing polytechnic	School A	Large	80	160	42
Dali Polytechnic	School C	Large	80	90	37
Lijiang Polytechnic	School B	Large	85	80	37
Yunnan Institute of Mechanical & Electrical Engineering	School A	Large	80	74	35
Tourism College of Kunming China	Specialty Group B	Large	85	74	38
Kunming Vocational and Technical College	School B	Large	80	72	51
Yunnan Industry & Trade Vocational College	Specialty Group C	Large	85	70	50

Table 1. (*Continued*).

Colleges Name	Type of Colleges	Size of Colleges	Number of teachers	The sample size for the assessment	Numbers of Sample
Yunnan Institute of Communications	Specialty Group B	Medium	50	33	22
Yunnan Business College	Specialty Group C	Medium	55	33	28
Yunnan Economic & Trade Polytechnic	Specialty Group B	Medium	55	25	25
Yunnan Technical Institute of Economics	Specialty Group B	Medium	55	32	26
Yunnan Vocational Academy of Art	Specialty Group C	Medium	55	24	17
Yunnan College of Construction	Specialty Group A	Medium	50	26	19
Yunnan Financial College	School B	Medium	55	20	20
Yunnan Police Vocational Academy	Specialty Group C	Small	50	20	21
Total			1000	833	468

The interview samples for this study include 9 educational administrators, details as shown in the **Table 2**.

Table 2. Key informants in the focus group.

No.	Colleges Name	Educational administrators	Position	Numbers of Sample
1	Qujing polytechnic	W1		1
2	Dali Polytechnic	W2	Educational Administrators	1
3	Lijiang Polytechnic	W3		1
4	Yunnan Institute of Mechanical & Electrical Engineering	Y1		1
5	Tourism College of Kunming China	Y2	University Teachers	1
6	Kunming Vocational and Technical College	Y3		1
7	Kunming Railway Vocational and Technical College	Z1		1
8	Yunnan Electric Power Vocational College	Z2	Academic Experts	1
9	Zhaotong Vocational and Technical College	Z3		1
Total	9			

3.2. Research tool

A survey consisting of 100 items was utilized to assess the views of every individual regarding quality management. A panel of nine education specialists, all with doctorates or higher, examined a five-level educator opinion measure that was employed. The index of item-objective congruence (IOC) value was then used to assess each of the 105 items (Liu et al., 2021). Evaluations were conducted on the purpose of the questionnaire, item clarity, comprehensiveness, completeness, meaningfulness, and significance for each item. The study's IOC values ranged from 0.8 to 1.00, and experts recommended eliminating items with an IOC of less than 0.67 (Ma et al., 2021).

The reliability of the questionnaire was then assessed using fifty respondents who did not take part in the follow-up survey. Cronbach's alpha was utilized to evaluate the questionnaire try-out reliability for 50 individuals ($\alpha = 0.979$).

The 56 vocational colleges in Yunnan province wrote to the researcher before the final survey to request permission to gather survey data. Teachers were randomly

chosen, contacted by Line social media, and provided with a QR code for the questionnaire to participate in after each school gave permission.

3.3. Data analysis

The correlation coefficients between the variables were investigated using descriptive statistics (percentage, mean, and standard deviation), the Kaiser-Meter-Olkin (KMO), and Bartlett's test of sphericity based on the quality management core components analysis. Principal Component investigation (PCA) was also used in the investigation to extract the factors and identify the most significant variables. It was composed of the percentage of variance, cumulative percentage of variance, eigenvalues, and components.

Using the selection criteria for question variables with a factor loading ≥0.050 and the number of variables in each component, the Varimax rotation method more clearly defined the correlation between variables being more common as a constituent to find the quality management core components. To be regarded as a single component, there must be three variables at minimum.

4. Results and findings

4.1. Correlation matrix suitability results

There are sufficient correlations between variables for variables assessing indicators, as **Table 3**'s KMO (Kaiser-Meyer-Olkin Measure of Sampling Adequacy) reveals that the correlation matrix of the observed variables was not unique (Changwon et al., 2018). The KMO Measure of Sampling Adequacy = 0.957, which is regarded as outstanding, confirmed this. Additionally, the usefulness of moving forward with factor extraction was evaluated using Bartlett's test of sphericity. The correlation matrix's identity matrix hypothesis is being tested. The statistical significance (Sig.) of the Chi-Square = 15,623.423 was determined to be 0.000, $p \leq 0.05$, showing that the generated correlation matrix is not a unity matrix. This verified the correlation between the variables and their suitability for factor analysis.

Table 3. KMO and bartlett test.

KMO and Bartlett Test		
KMO	0.957	
	Chi-Square	15,623.423
Bartlett	df	780
	p	0.000

4.2. Factor extraction and rotation

To ascertain which variables were most crucial, the researcher used Principal Component Analysis (PCA) to identify the elements. According to Abdi, it is composed of the components, eigenvalues, variance percentage, and cumulative variance. It has been proposed by Lin (2017) that factors with eigenvalues ≥1.00 be retained.

The eigenvalues, or the sum of the squares of the coefficients of each factor ≥1.00,

are displayed in **Table 4**, additionally, it displays the five components' total variance percentage, which is 67.470%. Since there are less than three factors in each element, the fifth and sixth factors are not grouped. Furthermore, which provide the following descriptive definitions for each component:

- Component 1 = College Graduate Quality
- Component 2 = Teaching Quality
- Component 3 = Hardware Environment
- Component 4 = Social Support
- Component 5 = Job Satisfaction

Table 4. Component analysis.

Components	Eigen Values	Percentage of Variance %	Percentage of Variance Cumulative %
1	10.06	25.151	25.151
2	9.079	22.698	47.849
3	4.324	10.811	58.660
4	2.245	5.613	64.273
5	1.279	3.197	67.470

Table 5 displays the analysis from the Varimax rotation, which is often a PCA, and the second stage in factor analysis. Rotate the factors with a Varimax to create new, easier-to-understand factors in place of the original ones. The variables in each orthogonal rotation component must have a weight of or greater, as determined by the Varimax method analysis of the component findings. The quality management core value analysis of the study was conducted by the investigator, who selected the highest weight >0.5 for each factor. Group A: Variables A1 to A14 are primarily associated with Factor 2. Factor Loadings: All variables have loading values close to 0.8 on Factor 2, indicating a strong correlation with Factor 2. Communalities: The communalities range from 0.625 to 0.680, indicating that a large portion of the variance of these variables (62.5% to 68%) is explained by the extracted factor. Group B: Variables B1 to B14 are primarily associated with Factor 1. Factor Loadings: All variables have loading values close to 0.8 on Factor 1, indicating a strong correlation with Factor 1. Communalities: The communalities range from 0.620 to 0.675, indicating that a large portion of the variance of these variables (62% to 67.5%) is explained by the extracted factor. Group C: Variables C1 to C6 are primarily associated with Factor 3. Factor Loadings: All variables have loading values close to 0.8 on Factor 3, indicating a strong correlation with Factor 3. Communalities: The communalities range from 0.693 to 0.735, indicating that a large portion of the variance of these variables (69.3% to 73.5%) is explained by the extracted factor. Group D: Variables D1 to D3 are primarily associated with Factor 4. Factor Loadings: All variables have loading values close to 0.87 on Factor 4, indicating a very strong correlation with Factor 4.

Table 5. Varimax rotation.

Items	Factor loading					Communalities
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	
A1	0.029	**0.808**	0.143	0.001	0.075	0.680
A2	0.018	**0.798**	0.080	0.008	0.053	0.647
A3	−0.020	**0.783**	0.105	0.013	0.032	0.625
A4	0.016	**0.789**	0.097	−0.019	0.054	0.636
A5	0.043	**0.795**	0.102	−0.009	0.024	0.644
A6	0.061	**0.789**	0.071	0.096	0.077	0.647
A7	−0.008	**0.807**	0.073	−0.093	0.004	0.666
A8	−0.007	**0.797**	0.067	0.063	0.071	0.648
A9	0.023	**0.781**	0.115	0.010	0.094	0.632
A10	−0.027	**0.791**	0.041	0.050	0.045	0.633
A11	0.004	**0.785**	0.099	0.006	0.024	0.627
A12	0.002	**0.798**	0.100	−0.051	0.069	0.654
A13	−0.040	**0.797**	0.061	0.005	−0.019	0.641
A14	0.025	**0.807**	0.126	0.067	0.030	0.672
B1	**0.807**	0.006	−0.048	−0.073	0.008	0.659
B2	**0.800**	0.024	−0.005	−0.005	0.001	0.640
B3	**0.785**	0.026	0.007	−0.022	−0.058	0.620
B4	**0.800**	−0.019	−0.014	0.023	−0.011	0.641
B5	**0.796**	−0.017	0.038	−0.029	−0.013	0.637
B6	**0.800**	−0.043	0.001	−0.049	0.010	0.644
B7	**0.799**	0.031	−0.021	−0.025	−0.010	0.641
B8	**0.817**	0.008	0.025	−0.022	−0.001	0.669
B9	**0.792**	0.002	0.044	−0.070	−0.054	0.636
B10	**0.820**	0.009	−0.033	−0.013	0.041	0.675
B11	**0.804**	0.037	−0.025	−0.014	0.014	0.649
B12	**0.817**	−0.007	−0.017	0.032	0.036	0.670
B13	**0.800**	0.034	0.038	0.018	0.053	0.646
B14	**0.816**	0.006	−0.011	−0.016	−0.061	0.670
C1	−0.011	0.142	**0.821**	0.017	0.166	0.723
C2	0.003	0.171	**0.808**	0.010	0.129	0.698
C3	−0.030	0.157	**0.823**	0.029	0.135	0.721
C4	0.021	0.144	**0.808**	0.056	0.127	0.693
C5	−0.003	0.144	**0.827**	0.029	0.127	0.722
C6	0.008	0.150	**0.826**	−0.004	0.174	0.735
D1	−0.035	0.017	−0.009	**0.878**	0.006	0.772
D2	−0.051	0.079	0.116	**0.839**	0.044	0.728
D3	−0.080	−0.017	0.009	**0.871**	0.049	0.767
E1	−0.006	0.148	0.337	0.043	**0.792**	0.765
E2	−0.047	0.114	0.318	0.046	**0.790**	0.743
E3	0.021	0.174	0.363	0.039	**0.779**	0.771

Communalities: The communalities range from 0.728 to 0.772, indicating that a large portion of the variance of these variables (72.8% to 77.2%) is explained by the extracted factor. Group E: Variables E1 to E3 are primarily associated with Factor 5. Factor Loadings: All variables have loading values close to 0.79 on Factor 5, indicating a strong correlation with Factor 5. Communalities: The communalities range from 0.743 to 0.771, indicating that a large portion of the variance of these variables (74.3% to 77.1%) is explained by the extracted factor.

In summary, the communalities of each variable indicate how much of its total variance is explained by the extracted factors. Higher communalities (close to 1) suggest that the extracted factors explain the variance of the variable well. Overall, the dimensionality reduction effect of this factor analysis is satisfactory.
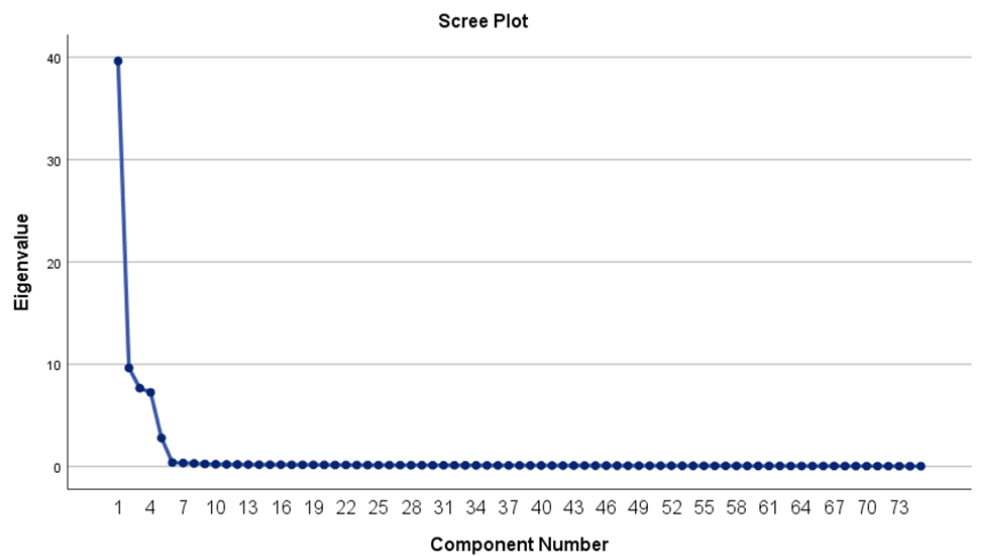

Figure 1. Scree plot.

In the scree plot shown in **Figure 1**, the slope between the 5th and 6th factors becomes less steep, indicating that the amount of information explained by the subsequent 6th factor decreases significantly. This suggests that the first 5 factors can cover most of the information, thus selecting 5 factors is appropriate.

Table 6 shows the quality management core components weight results arranged in order of **Table 4**'s eigenvalues.

Table 6. Components weight.

Components	Percentage of Variance Cumulative %	
	Lowest	**Highest**
1	0.826	0.865
2	0.835	0.893
3	0.858	0.884
4	0.850	0.891
5	0.840	0.879

The means, standard deviations, and opinion rankings for the quality management components are displayed in **Table 7**. The respondents deemed

Component 1 (Emphasize teachers' acceptance of diversity) to be the most crucial core factor in quality management overall, according to the results (mean = 4.56, SD = 0.49). The last three components, which had almost identical ranking scores, came after this.

Table 7. Means, standard deviations, and opinion rankings.

Components	Mean	SD	Rank
1	4.56	0.49	High
2	4.39	0.42	High
3	4.38	0.44	High
4	4.37	0.42	High
5	4.38	0.42	High
Summations	4.42	0.44	High

From the results of the analysis of the factors of quality management for graduates, there are a total of 5 Factors, which can be summarized in the following **Figure 2**:
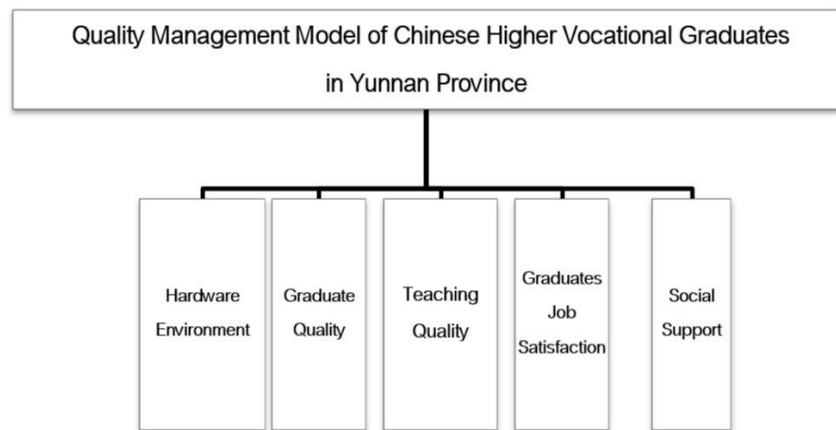

Figure 2. Graduate quality management model.

5. Discussion

This survey revealed the multifaceted factors influencing graduate quality management. EFA data analysis depicts a substantial positive impact on graduation quality management, especially the importance of the quality of graduates themselves and the quality of teaching.

Component 1: College graduate quality.

The quality of graduates directly influences their competitiveness in the job market. Higher vocational colleges focus on equipping students with practical skills and knowledge relevant to their chosen fields. Graduates with high-quality skills and competencies are more likely to secure employment and contribute effectively to their industries. A college's reputation is closely tied to the performance of its graduates. Employers often evaluate the quality of graduates when considering partnerships with educational institutions or hiring their alumni. High-quality graduates enhance a college's reputation, attract prospective students, and elevate its standing in the education sector. Effective graduate quality management ensures that colleges provide

skills and knowledge aligned with industry needs, contributing to a skilled workforce capable of driving economic growth and innovation.

Component 2: Teaching quality.

Teaching quality directly impacts graduates' competence and skills. Higher vocational colleges strive to deliver practical and industry-relevant education. Quality teaching ensures graduates are equipped with necessary knowledge and skills, enhancing their employability and effectiveness in the workforce. Beyond theoretical knowledge, quality teaching fosters professionalism, shaping graduates who are not only competent but also ethical and responsible professionals. Effective teaching quality management aligns curriculum and teaching methods with industry standards, ensuring graduates meet employers' needs and industry practices, thus increasing their likelihood of success in their careers.

Component 3: Hardware environment.

A well-equipped hardware environment offers students hands-on learning experiences. Practical training and modern equipment enable students to apply theoretical knowledge in real-world scenarios, enhancing their understanding and competency. This hands-on approach is essential for developing practical skills and preparing graduates for the workforce. Specialized facilities support the development of specific skills required in various vocational fields. For instance, engineering workshops and computer labs allow students to gain technical skills necessary for their careers. Advanced equipment fosters research and innovation, enabling students to explore new ideas and technologies, enhancing problem-solving abilities, and preparing them for future contributions in their fields.

Component 4: Social support.

Social support systems within colleges, including career guidance counselors and alumni networks, assist students in navigating their academic and career paths. These resources provide valuable guidance, advice, and encouragement, contributing to better outcomes for graduates. Effective career guidance ensures graduates are prepared for the transition from education to employment. Social support networks facilitate professional connections, enhancing graduates' employability and providing opportunities for career advancement. Engagement in community-based activities fosters a sense of community engagement and social responsibility among students, enriching their educational experiences and personal growth.

Component 5: Job satisfaction.

Job satisfaction is crucial for employee retention and productivity. Satisfied graduates are more likely to stay with their employers, reducing turnover rates and associated costs. Job satisfaction correlates with motivation, engagement, and productivity, leading to improved performance and outcomes. Colleges that prioritize job satisfaction contribute to a skilled workforce that meets employers' needs and drives economic growth. Opportunities for career advancement and professional development further enhance job satisfaction and contribute to graduates' continued success in their careers.

This study offers insights into the roles of university administrators and teachers in graduate quality management. The positive correlation among the five factors underscores the importance of effective management practices in improving graduate outcomes. Investing in faculty development and management enhancement initiatives

can further improve graduate management outcomes. Future research should explore additional factors to provide a comprehensive understanding of graduate quality management, enriching our knowledge base and guiding future management practices in educational settings.

6. Conclusion

This study represents a significant breakthrough by extending beyond traditional employment-focused factors to encompass broader dimensions of graduate management in higher vocational colleges. By innovating new perspectives and constructing a novel graduate quality management model, it offers a fresh approach to addressing the multifaceted challenges in this domain. However, to fully grasp the dynamics between the five identified factors of graduate quality management and the overall management of higher vocational colleges, further detailed research is warranted. Moving forward, it is imperative to expand the research agenda to encompass both intrinsic and extrinsic motivational factors influencing graduate outcomes. Investigating how different management strategies impact graduates' success and how teaching and management practices influence the holistic significance of graduates can lay the groundwork for innovative educational management theories. Moreover, conducting multicultural research on these phenomena can enhance our understanding and facilitate the development of more effective, culturally sensitive, and nuanced support systems for educators worldwide. In essence, future research endeavors should strive to bridge disciplinary boundaries, integrate diverse perspectives, and delve deeper into the intricate dynamics of graduate management in higher vocational education. By doing so, we can foster the emergence of transformative management approaches that better serve the needs of graduates and contribute to the advancement of vocational education on a global scale.

7. Future recommendation

Although the study's goals and objectives have been met, there are a few inescapable constraints that must be addressed in this part for all future researchers to address. Due to the tight timeline and scarce resources, research can only be broadly applied to higher vocational colleges in China. Therefore, to broaden the scope of the study and generalize it on a global scale, future research should include more people from throughout the globe. The higher vocational colleges' employees will have better knowledge, skills, and abilities as a result of the adoption of the quality management model in China. All graduates will benefit from updating their expertise in this way, enabling them to deliver the best services for higher vocational colleges.

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