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THE STUDY ON THE IMPACT OF TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING ON THE EMPLOYMENT COMPETITIVENESS IN YUNNAN PROVINCE, CHINA

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ABSTRACT

This study investigates the impact of Technical and Vocational Education and Training (TVET) on employment competence in Yunnan Province, China. TVET is examined through two key dimensions: the quality of vocational education and the level of skill proficiency. Employment competence is divided into two categories: the "external" dimension, which includes employability and job stability, and the "internal" dimension, encompassing job satisfaction and salary levels. The study collected 495 responses by the WenJuanXing and stratified random sampling method based on majors (Industrial Engineering, Agriculture, Tourism, Healthcare, and Internet Engineering). This study uses five Likert scale questionnaires to collect data, and analyses data through quantitative research method to examine the impact of TVET on employment competence in the province. Findings revealed that the indirect effects of TVET on employment competence ranged from 0.118 to 0.154, with p-values equal to 0, indicating highly significant relationships. Path coefficient analysis further supported these results, as all p-values were statistically significant (p = 0), and T-statistics ranged from 5.278 to 11.477, demonstrating strong positive effects across all tested relationships.

KEYWORDS: TVET; Employment Competence; Job Satisfaction; Employability; Work Stability; Salary Level.

1. INTRODUCTION

The COVID-19 pandemic, which started at the end of 2019, has had far-reaching implications on various aspects of life worldwide. One of the most significant impacts of the pandemic has been on the global economy, particularly on employment rates. The closure of businesses and the implementation of social distancing measures have resulted in massive layoffs and furloughs, resulting in a spike in unemployment rates worldwide. Global GDP was projected to contract by -3% in 2020, with more developed economies like the U.S. experiencing a 6% decline in GDP in the second quarter of 2020 alone. According to data from the International Monetary Fund (IMF), the U.S. GDP shrank at an annualized rate of -32.9% in Q2 2020, reflecting the significant economic slowdown caused by the pandemic (Fernandes, 2020). Unemployment and the associated socioeconomic fallout were not evenly distributed, however. Variations in the impact of COVID-19 on unemployment were evident across sectors, regions, and demographic groups. Some sectors, like hospitality and tourism, faced a near-total collapse, while others, such as healthcare and information technology, witnessed increased demand. Similarly, the severity of unemployment varies considerably from region to region and from country to country, influenced mainly by the nature of their economies, the stringency of the imposition of the embargo, the resilience of their health-care systems, and the ability of their Governments to provide economic stimulus and support.

Lardy (2019) explains that the manufacturing sector, which plays a crucial role in China's economic growth and job creation, has been hit particularly hard. Tariffs on Chinese goods have weakened external demand, particularly from major trading partners such as the United States. Unemployment is concentrated in these areas as companies reduce their workforce to accommodate the shrinking market. More broadly, the trade war has exacerbated existing vulnerabilities in China's labour market, particularly in areas that are heavily dependent on exports. Governments around the world have undertaken a range of policy interventions to mitigate the crisis and support economic recovery. However, the long-term impact of pandemics on global unemployment and the effectiveness of these policy responses remain important areas for research (Gurria, 2020.)

Li and Noureldin (2024) explain the need for the global economy to focus on productivity reforms in order to tackle stagnant growth. The article points out that structural reforms in the areas of labour, capital investment and technology are essential to promote economic growth in the medium term. Furthermore, the article warns that without such reforms, demographic changes and low investment rates may continue to dampen productivity, threatening future economic stability. Figure 1.1 illustrates the growth of world real GDP in recent years, from which it can be seen that there has been a declining trend in GDP growth in recent years.

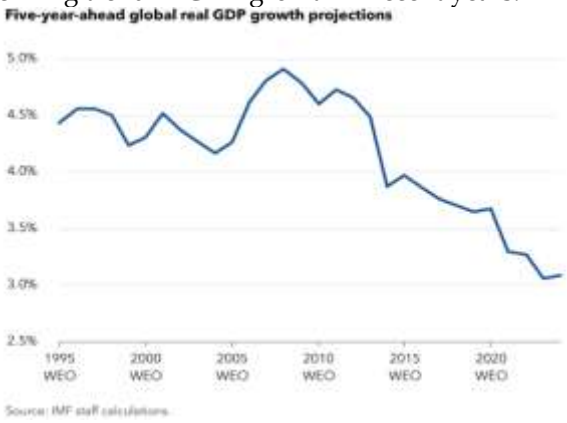

Figure 1: Five Years of World Real GDP Growth Rate.

Nicola et al. (2020) provide a comprehensive review of the wide-ranging socioeconomic impacts of COVID-19, describing the many facets of how the epidemic has impacted healthcare systems, the global economy, and the dynamics of specific industries. The author's emphases that COVID-19 has played a disruptive role globally, with far-reaching economic and societal impacts that vary widely across industries and regions. This interdisciplinary review synthesis research findings and data from a variety of fields to provide a comprehensive picture of the epidemic's impact on both the macro and micro spheres. In terms of economic impacts, they explore disruptions to trade, employment and financial markets. Moreover, they highlight how transportation restrictions and border closures prevented the movement of goods, leading to supply chain bottlenecks and shortages of essential products. The paper discusses the knock-on effects of these disruptions on industries that rely heavily on global supply chains, such as the manufacturing, retail and technology industries. As a result, many firms face reduced production capacity, shipment delays and loss of revenue, while sectors such as e-commerce and technology experienced growth as demand shifts to digital platforms.

Yunnan, a province located in southwestern China, has a unique job market due to its diverse socioeconomic and geographical features. Students graduating from TVET can find suitable jobs in Yunnan, which require personnel with special skills more than general education. Yunnan has always

attached great importance to the development of TVET, especially in recent years, Yunnan's TVET has made rapid progress, expanding in scale, and improving in structure. Yunnan is known for its rich biodiversity and agricultural activities, including cultivation of crops like rice, corn, and tobacco. Therefore, students with TVET training in agricultural technologies, agribusiness, and related fields may find opportunities in this sector (Wu & Wu, 2015). Employment in Yunnan Province offers several unique advantages, benefiting from the region's strategic location, natural resources, and diverse economic initiatives. Yunnan's position as a gateway to Southeast Asia enhances its appeal for employment, especially in trade, logistics, and industries that capitalize on cross-border business opportunities. This regional advantage supports a dynamic job market in logistics, tourism, and international trade sectors, making it a significant contributor to employment growth (Wang and Li 2024).

The impact on the economy was also serious, with a large number of factories and businesses at risk of closure in a period of economic downturn. The pandemic led to a sharp contraction in global economic activity, with global output significantly below re-epidemic levels. Embargoes, social isolation, and other public health measures taken to contain the virus severely disrupted sectors such as tourism, hospitality, and retail. The economic downturn was more pronounced in middle- and low-income countries owing to limited fiscal capacity and preexisting vulnerabilities. In response, many governments enacted massive fiscal stimulus packages, which led to an increase in government debt and monetary expansion, temporarily establishing the economy but also contributing to inflationary pressures in the following years (Martin et al., 2023). The labour market changed dramatically, with unemployment rates reaching record highs. For example, in the United States, the unemployment rate peaked at 14.8% in April 2020, the highest since the 1940s. The pandemic disproportionately affected low-wage workers and those in service industries who were unable to transition to teleworking. While some industries recovered relatively quickly, others, especially those dependent on physical presence, continue to struggle. This shift has also led to changes in labour force participation rates and accelerated trends such as teleworking and automation (Sheiner et al., 2024).

Increased unemployment rates, whether cyclical, structural, or frictional, present a host of social, economic, and psychological challenges. For example, unemployment leads to a loss of income for individuals and a decrease in the overall spending capability of a society. Keynesian economists like John Maynard Keynes argue that this can lead to reduced economic demand, which can further perpetuate unemployment and potentially lead to economic recession (Keynes, 1936). Unemployment tends to exacerbate income inequality, as people with less education or vocational training face greater challenges in obtaining stable, well-paid jobs. This disadvantage is particularly pronounced in highly competitive labor markets, where higher-skilled workers tend to have access to available jobs, while those with lower skills are trapped in a cycle of underemployment or unemployment. Over time, this exclusion from the labor force can deepen poverty as families without sufficient income are unable to invest in education, health, or skills development, thus perpetuating economic hardship from one generation to the next (Piketty, 2014).

TVET Institutions focus on developing the skill level of the trainees while enhancing their personal competence at work. In Malaysia, competent employees are vital to the performance and competitiveness of an organization, and the enhancement of individual competencies can reduce the gap in the workforce (Salleh & Sulaiman, 2016). In other words, employees who have been trained systematically are more preferred by employers and have more stable jobs. Yunnan's TVET institutions play a crucial role in enhancing employability and addressing labour challenges through a variety of strategies.Guo and Lamb emphasized that Yunnan's TVET system has undergone significant reforms to respond to industry needs. These reforms included comprehensive reform programs, investment in infrastructure and teacher training to ensure the provision of practical, industry-relevant education. In addition, collaboration with organizations such as UNESCO has enhanced the system's impact and effectiveness. Data show that these reforms have greatly enhanced employability in the region, with a large proportion of TVET graduates moving into skilled jobs in areas such as agriculture, manufacturing and green industries (Guo & Lamb, 2010).

TVET institutions are able to develop skilled people who are ready to enter the labour market and improve the efficiency of the transition from school to work. In Rwanda, 87% of respondents believe that TVET schools provide students with the basic skills needed for the job market, and that graduates are more employable than university graduates (Niyibizi & Mugiraneza, 2024).Salleh & Sulaiman (2016) found

that Malaysian organizations are increasingly integrating employee competencies with job tasks in order to better prepare workers for the labour market - an approach that coincides with the core mission of TVET.

In nowadays, the Chinese government has invested a lot of effort in improving TVET institutions.

For example, the Chinese government has issued multiple policies linking TVET to national development goals, focusing on building a modern TVET system, competency-oriented curricula, student and employer incentives, and workplace-based training (Chen et al., 2024). On the other hand, TVET has moved from quantity expansion to quality improvement, supported by strong government attention. Recent efforts include legal frameworks, infrastructure building, teacher enhancement, and adoption of digital or online education to expand access (Fan et al., 2024).

Under the title 'A study of the impact of technical and vocational education and training (TVET) on employment competitiveness in Yunnan Province, China', an in-depth investigation was conducted into the important contribution of TVET in shaping employment competitiveness in Yunnan Province. The study examines the impact of graduates and employability of TVET programs on employment competitiveness.

The study analyses the impact of job stability and employability of skilled personnel from TVET institutions on employment competitiveness in Yunnan Province. In addition, it assessed the impact of TVET on job satisfaction and income levels. In addition, this study examines the impact of skill proficiency and employment competitiveness in TVET. The focus of this study is to investigate the link between TVET and employment competitiveness in Yunnan Province, China. Together, these objectives contribute to a comprehensive understanding of the significance of TVET and provide valuable insights that can guide policy decisions to improve the pathway from education to employment in Yunnan Province, China.

This study investigates the impact of TVET on employment competitiveness in Yunnan Province, China. The TVET is the independent variable, and the employment competitiveness is the dependent variable. Skill proficiency as a mediating variable in order to examine the impact of TVET on employment competitiveness.

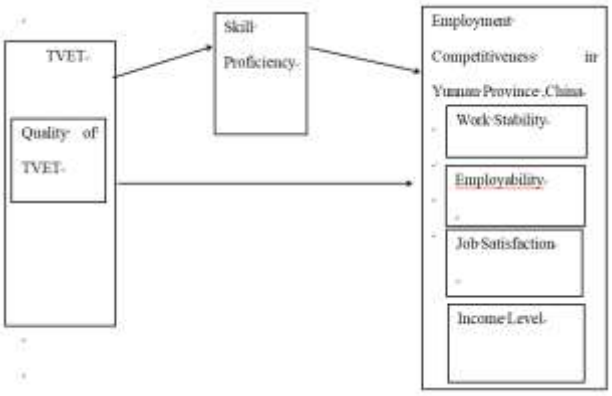

Figure 2: Conceptual Framework.

2. METHODOLOGY

Located in southwestern China, Yunnan Province is known for its diverse geography and rich cultural heritage. Bordering Myanmar, Laos and Vietnam, the province is an important hub for cross-border trade and cultural exchange. This study investigates the impact of TVET on employment competitiveness in Yunnan Province, China. There are 86 TVET institutions in Yunnan Province, producing about 175,500 graduates of TVET institutions. This study uses the questionnaire as a research instrument. Questionnaires allow for the systematic collection of data from a large number of individuals. This helps to generalize the findings to a larger population (Creswell & Creswell, 2017). For the sampling method, this study uses a random stratified sampling method to collect the sample of the graduates from TVET programs. The stratified random sampling technique is often used in research to ensure that different groups within a population are adequately represented. A representative sample, that captures the characteristics of the whole population can yield more reliable and generalist findings. Stratified random sampling can help to achieve a representative sample of employment competence by ensuring that important segments are proportionally included. The sample will be stratified by age and programs in this study. Among the TVET to educated population in Yunnan Province, the five most popular majors with large numbers of employed people are Industrial Engineering (20%), Agriculture (24%), Tourist Industry (22.67%), Health (14.67%), and Internet Engineering (18.67%). The simplicity and user-friendliness of the 5-point Likert scale allowed respondents to effectively indicate their level of agreement or interest. This simplicity helps to keep participants engaged and reduces response fatigue, which is essential for high response rates (Armstrong, 1987). Research has shown that the 5-

point format maintains reliability and internal consistency. It is particularly suitable for assessing attitudes and perceptions, producing reliable data without overloading participants with too many options (Sullivan & Artino, 2013).The ordinal nature of the 5-point scale makes it easy to interpret and analyse using basic statistical tools. This enhances its usability in generating mean scores, standard deviations, and other descriptive statistics that are essential for efficient data processing (Leung, 2011). This study uses quantitative research methods to assess the impact of technical and vocational education and training (TVET) on employment competitiveness. Quantitative research methods are characters by objectivity and the use of statistical techniques to analyse the relationships and impacts between variables, thereby increasing the reliability of the findings. This study focuses specifically on assessing how TVET programs affect the employment competitiveness of graduates in Yunnan Province, China. The study used random stratified sampling method to categories by profession. According to the Yunnan Provincial Statistical Yearbook (2021), there were 86 TVET institutions in the province and 175,500 graduates in that year. In order to collect data, a structured questionnaire was used as the main research tool in this study. Questionnaire is an effective tool for collecting standardized data from a large population. This study received a total of 614 questionnaire responses, which were distributed according to the proportions of the random stratified sampling method. Finally, 495 questionnaire responses were used.stratified random sampling, which ensured proportional representation of the different majors: The items of the questionnaire survey will be presented in the appendix A. 149 (30.1 percent) in industrial engineering, 109 (22 percent) in agriculture, 89 (17.9 percent) in tourism, 70 (14.1 percent) in health care and 79 (15.9 percent) in Internet engineering.

Table 1: Demographic Profile of Respondents.

Gender	Male	261	52.73%
	Female	234	47.27%
	18 - 24	209	42.22%
Age	25 - 34	187	37.78%
	≧35	99	20%
Industrial Engineering		149	30.1%
Agriculture		109	22%
Tourist Industry		89	17.9%
Health		70	14.1%
Internet Engineering		79	15.9%

3. RESULT

This study uses SMART PLS 4 to conduct an analysis of the 495 samples collected by questionnaire, focusing on the effect on the quality of TVET and the effect of skill proficiency on employment competitiveness, as well as the mediating effect of skill proficiency between the quality of TVET and employment competitiveness.

Reliability refers to the consistency or repeatability of measurements, indicating whether the same results can be obtained under consistent conditions. Validity, on the other hand, assesses the extent to which an instrument measures what it is intended to measure. Table 1 shows the reliability as well as the validity of the sample.

Table 2: Reliability and Validity.

	Cronbach's alpha	Composite reliability (rho_c)	Average variance extracted (AVE)
Employability	0.904	0.926	0.677
Job satisfaction	0.911	0.931	0.693
Quality	0.899	0.922	0.663
salary	0.906	0.927	0.68
skill	0.904	0.926	0.675
work stability	0.903	0.925	0.673

Table 2 presents the results of reliability and validity testing for six latent constructs: **Employability**, **Job Satisfaction**, **Quality**, **Salary**, **Skill**, and **Work Stability.** All constructs exhibit high internal consistency, as indicated by Cronbach's alpha values ranging from 0.899 (Quality) to 0.911 (Job Satisfaction), all well above the acceptable threshold of 0.70. Composite reliability (rho_c) values also demonstrate strong reliability, ranging from 0.922 to 0.931, exceeding the recommended minimum of 0.70. In addition, the average variance extracted (AVE) values for all constructs ranged from 0.663 to 0.693, which exceeded the critical value of 0.50, indicating sufficient convergent validity. These results confirm that all measurement concepts are reliable and valid for further structural equation modelling analysis.

According to Henseler et al. (2015), the HTMT ratio is a relatively new and reliable criterion for assessing the discriminant validity of structural equation modelling. It compares the mean value of item correlations across constructs (heterogeneous constructs) with the mean value of item correlations within the same construct (uni-constructed constructs). In general, values less than 0.85 indicate sufficient discriminant validity to suggest that the constructs are empirically distinct. Table 3 shows the heterogeneous-monomorphic (HTMT) ratios by matrix.

Table 3: Heterotrait-Monotrait (HTMT) Ratio.

	Employability	Job Satisfaction	Quality of TVET	Skill Acquisition of TVET	Salary Level	Work Stability
Employability						
Job Satisfaction	0.488					
Quality of TVET	0.407	0.52				
Skill Acquisition of TVET	0.46	0.469	0.474			
Salary Level	0.427	0.498	0.463	0.519		
Work Stability	0.474	0.51	0.435	0.47	0.426	

According to Table 3, all Heterotrait-Monotrait (HTMT) ratios are less than 0.85. It indicates that there is sufficient discriminative validity.

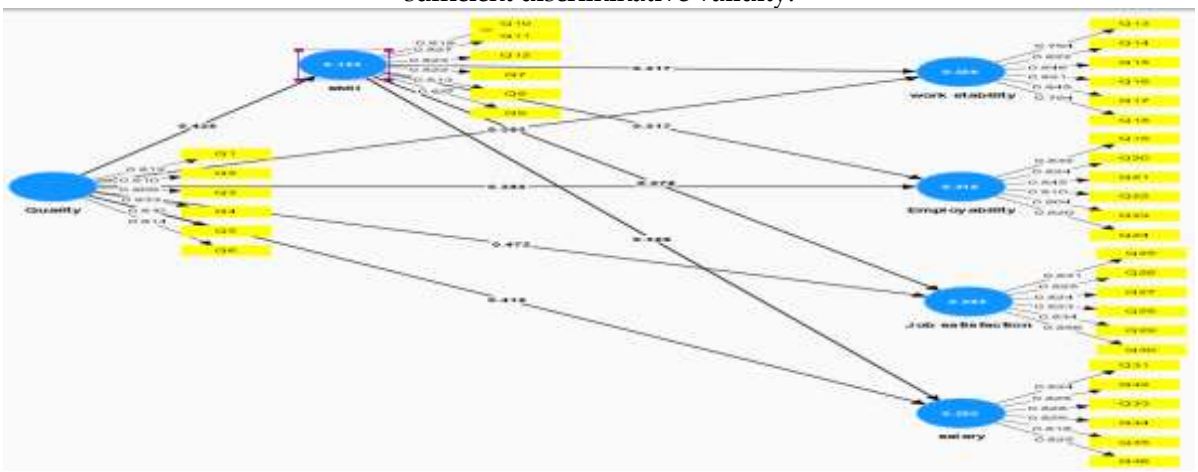

Figure 3: Measurement Model.

The coefficient of determination, often referred to as R-squared, is an important statistic used in quantitative research to assess the explanatory power of a model. It quantifies the proportion of variation in the dependent variable that can be explained by the independent variable.

Table 4: Coefficient of Determination.

	R-square	R-square adjusted
Employability	0.218	0.215
Job Satisfaction	0.285	0.282
Skill Proficiency	0.183	0.181
Salary	0.28	0.277
Work Stability	0.236	0.233

Table 4 presents the R-squared and adjusted R-squared values for the different constructs in the study. These constructs include employability, job satisfaction, skill proficiency, salary level and job stability.The R-squared values represent the proportion of variance in the dependent variable that can be explained by the independent variables and range from 0.183 for skill proficiency to 0.285 for job satisfaction. This indicates that among the listed constructs, job satisfaction is the most effective construct that can be explained by the model variables.

According to Hair et al. (2017), masking is a

sample reuse technique that systematically omits portions of the data during parameter estimation and then uses a model to predict these omitted data points. This process typically uses a cross-validation method that divides the data into subsets. Some subsets estimate the model parameters, while others validate the model predictions. The predictive relevance of the model is then assessed using a criterion such as the Q^2 value

Table 5: Construct Cross-Validated Redundancy.

	SSO	SSE	Q^2 (=1-SSE/SSO)
Employability	2970	2538.881	0.145
Job satisfaction	2970	2391.621	0.195
Quality of TVET	2970	2970	0
Skill proficiency	2970	2608.782	0.122
salary	2970	2410.492	0.188
work stability	2970	2506.974	0.156

The constructs of Employability (Q^2 = 0.145), Job Satisfaction (Q^2 = 0.195), Skill Proficiency (Q^2 = 0.122), Salary (Q^2 = 0.188), and Work Stability (Q^2 = 0.156) all exhibit positive Q^2 values, indicating acceptable predictive relevance. However, the construct "Quality of TVET" has a Q^2 value of 0, suggesting it is an exogenous variable in the model and not subject to prediction. According to Hair et al. (2019), Q^2 values greater than zero indicate that the model has predictive relevance for a particular endogenous construct.(Q^2 > 0.15: Indicates a medium predictive relevance.)

Table 6: Significance of the Path Coefficients.

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Quality -> Employability	0.233	0.233	0.044	5.257	0
Quality -> Job satisfaction	0.354	0.352	0.041	8.659	0
Quality -> salary	0.264	0.263	0.04	6.615	0
Quality -> skill	0.428	0.429	0.037	11.477	0
Quality -> work stability	0.257	0.257	0.041	6.287	0
skill -> Employability	0.317	0.318	0.044	7.292	0
skill -> Job satisfaction	0.276	0.277	0.042	6.62	0
skill -> salary	0.359	0.36	0.04	8.892	0
skill -> work stability	0.317	0.319	0.041	7.655	0

According to table 6, all path coefficients in the model are statistically significant at the $p < 0.001$ level. The strongest direct relationship is observed between **Quality** and **Skill** (β = 0.428, t = 11.477), indicating a substantial impact of TVET quality on skill proficiency. Similarly, **Skill** has a strong effect on **Salary** (β = 0.359, t = 8.892), reflecting the importance of skill acquisition for better income outcomes. These results support the theoretical assumption that both the quality of TVET and skill proficiency significantly influence employment-related outcomes including employability, job satisfaction, salary, and work stability.

Table 7: Total Indirect Effects.

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Quality -> Employability	0.136	0.137	0.023	5.974	0
Quality -> Job satisfaction	0.118	0.119	0.02	5.798	0
Quality -> salary	0.154	0.154	0.021	7.17	0
Quality -> work stability	0.136	0.137	0.022	6.09	0

The table 7 shows the path from **Quality** to **Employability** shows a significant positive relationship, with an original sample estimate (O) of 0.136. The T-statistic is 5.974, and the p-value is 0, indicating high significance. The impact of **Quality** on **Job Satisfaction** also shows a significant positive relationship with an original sample estimate (O) of 0.118. The T-statistic of 5.798 and a p-value of 0 further suggest a strong statistical significance. **Quality** has the strongest impact on Salary, with an original sample estimate (O) of 0.154. The T-statistic is 7.170, again with a highly significant p-value of 0. The path from **Quality** to **Work Stability** shows a significant positive relationship, similar to

Employability, with an original sample estimate (O) of 0.136. The T-statistic is 6.090, and the p-value is 0, confirming the statistical significance. The analysis demonstrates that **Quality** has a statistically significant and positive relationship with **Employability**, **Job Satisfaction**, **Salary**, and **Work Stability**. All p-values are below 0.05, confirming the high significance of these relationships. The strongest impact is observed on Salary (O = 0.154, T = 7.170), while the smallest is on Job Satisfaction (O = 0.118, T = 5.798).

Table 8: Specific Indirect Effects.

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Quality -> skill -> salary	0.154	0.154	0.021	7.17	0
Quality -> skill -> work stability	0.136	0.137	0.022	6.09	0
Quality -> skill -> Employability	0.136	0.137	0.023	5.974	0
Quality -> skill -> Job satisfaction	0.118	0.119	0.02	5.798	0

From table 8, the indirect effect of **Quality** on **Salary** through Skill is 0.154. The T-statistic is 7.170, which indicates a highly significant effect, supported by a p-value of 0. This means that **Quality** improvement indirectly affects **Salary** by enhancing skill levels. For **Work Stability**, the specific indirect effect is 0.136, with a T-statistic of 6.090 and a p-value of 0, showing that skills developed through quality improvements significantly contribute to greater **Work Stability**. The indirect effect on **Employability** is 0.136, with a T-statistic of 5.974 and a p-value of 0, which confirms that quality improves **Employability** indirectly by enhancing skills. The effect on **Job Satisfaction** is 0.118, with a T-statistic of 5.798 and a p-value of 0. This shows that skills gained through better quality have a positive and significant indirect effect on **Job Satisfaction**. In all cases, the indirect effect of **Quality** through **Skill** on outcomes (Salary, Work Stability, Employability, Job Satisfaction) is statistically significant. This indicates that improving **Quality** indirectly boosts these employment outcomes by enhancing **Skills**, as evidenced by the significant T-statistics and p-values across all pathways.

According to the indirect effects(table 7) of "**Quality of TVET**" on all dependent variables(employability, job satisfaction, salary, and work stability) through "**Skill Proficiency**" are significant, as indicated by T-statistics above 1.96 for all indirect effects.This suggests that skill significantly mediates the relationship between quality and all the dependent variables of competitiveness on employment. Since both the direct and indirect paths (table 4) are significant for the relationships between "quality of TVET" and the dependent variables, this suggests partial mediation.

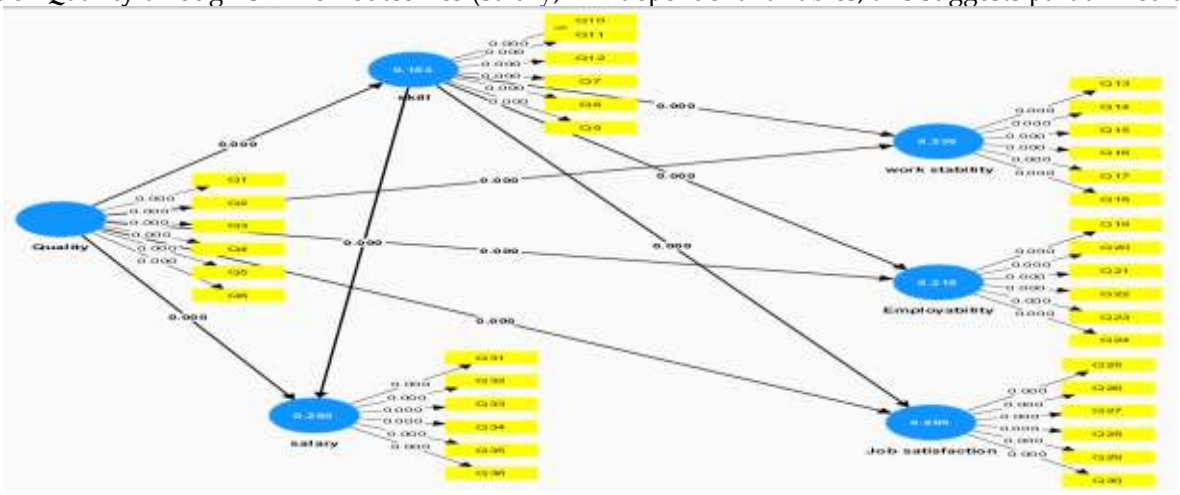

Figure 4: Structural Model.

4. CONCLUSION AND DISCUSSION

Based on the findings of this study, the quality and skill proficiency of TVET has a positive effect on the competitiveness of employment, the findings of the study support the hypothesis of this study that improving the quality of teaching and learning in TVET institutions has a positive effect on job competitiveness in Yunnan Province China. Most significantly, there is a strong effect between the

quality of TVET and skill proficiency, proved that improving the quality of TVET can greatly help to improve skill proficiency in Yunnan Province, China. Climbing unemployment can cause many social problems, especially for youth, for example, young people are more likely to increase crime rates if they lose their jobs. Improving the quality of TVET institutions improves the skill level of trainees and also increases their competitiveness for employment, making trainees with high-quality TVET training more desirable to employers in the context of the economic downturn. The TVET program is not directly related to social stability; however, it was found through the results of this study that maintaining the high quality of TVET institutions can contribute to higher levels of employment for young people. However, in China, economic and regional disparities, particularly between urban and rural areas, continue to create uneven development across TVET institutions. Inland provinces suffer from teacher shortages and weaker infrastructure, which affects training quality (Fan et al., 2024). High-quality TVET is not just about having outstanding teachers, but also about having equipment that is up-to-date. This requires TVET organizations to have more funds for equipment upgrades as well as maintenance. TVET teachers in China report limited digital competencies, which significantly restricts the digital transformation and modernization of TVET teaching methods and content. This digital skill gap encompasses not only a lack of technical knowledge and proficiency in using educational technologies but also a deficiency in integrating digital tools into pedagogical practices effectively. As the demand for digital literacy in the workforce increases, this shortfall poses a major barrier to aligning vocational education with the evolving needs of industry. Without adequate digital competencies, teachers are unable to deliver up-to-date, engaging, and practical instruction, thereby limiting students' preparedness for technology-driven job markets. Addressing this issue requires systemic investment in teacher training, infrastructure, and institutional support to ensure that digital tools are not only available but also meaningfully incorporated into daily teaching and learning practices (Xin et al., 2024). Although the financial investment in TVET institutions has been increasing every year, it has always remained at a low level, accounting for only about 10 percent of the total investment in education in Yunnan Province China. In the background of the study, it was described that COVID-19 brought an economic depression, which led to increased unemployment in China, especially in economically underdeveloped areas such as Yunnan Province. Young people and less educated people are more likely to lose their jobs in the event of a pandemic outbreak (Adams-Prassl et al., 2020). Coibion et al. (2020) discuss that such an impact is not gradual but immediate. The main reason is the closure of businesses, not a fading economy. However, in China, COVID-19 has only contributed to the economic slowdown and unemployment in the short term. In the long term, Lardy (2019) links the rise in unemployment to the negative impact of trade tensions, particularly tariffs on key Chinese exports, which led to job losses in the manufacturing sector. In order to strengthen the competitiveness in employment of graduates, Chinese students need to break the bias against TVET institutions and increase the proportion of students entering TVET organizations for study and training, which will make a positive contribution to the problem of high unemployment among graduates. Among rural migrant girls in western China, TVET is often one of the few accessible education options. Despite its benefits, students acknowledge its lower social prestige and limited pathways for advancement compared to academic education. The bias is compounded by gender norms and migration-related disadvantages (Li & Seeberg, 2022). There is another reason why Chinese students are biased against TVET organizations,TVET graduates face limited upward mobility and fewer opportunities for continuing into higher education, further cementing the idea that TVET offers fewer life opportunities compared to traditional academic pathways (Chen et al., 2024). Allowing technically inclined students to enter TVET institutions earlier in their academic journey—rather than postponing technical training until after graduation—enables them to acquire practical skills during their most formative and adaptable years. Early exposure to vocational education maximizes their learning potential, aligns with their interests and aptitudes, and fosters deeper engagement. This approach not only enhances their individual career prospects by equipping them with market-relevant competencies at a younger age, but also contributes to a more skilled local workforce. In turn, this can stimulate regional economic growth, reduce youth unemployment, and better meet the evolving demands of local industries. For Yunnan Province, China, regional characteristics are unavoidable, and all policies need to be based on the particularities of each region. For example, Yunnan Province's flower-growing industry is very well developed and famous in China and even in the world. Yunnan Province has some of the cheapest flowers exported to all areas in China. However,

floriculture technology is not the most specialized in TVET institutions in Yunnan Province, and most of the skills in floriculture have been developed by local farmers who have low levels of education through their own experience. Therefore, TVET institutions in Yunnan Province could add more major courses to compound the characteristics of the local economy. Capitalising on the strengths of local characteristics leads to higher employment and special skills development, which in turn leads to the overall regional economy. The background to the investigation of this study is based on the impact of COVID-19 on the unemployment rate. However, it is only in the short term, and in the long term, economic slowdown and the rise of artificial intelligence could also increase China's unemployment rate. Short-term studies cannot capture trends or changes that occur over an extended period, such as gradual developments, evolving behaviors, or delayed effects. Short-term studies often fail to observe the delayed or cumulative effects of certain variables or interventions. To address the limitations of studying phenomena in the short term, researchers can adopt several strategies to ensure a more comprehensive and reliable understanding of the subject. By incorporating long-term data, considering contextual factors, and using more robust research designs, the accuracy and generalisability of the findings can be improved. For deep discussion in the future, the impact of the unemployment rate and its reasons require researchers to eliminate the influence of objective factors to study the impact of the TVET programme on employment competitiveness rather than in special circumstances. In recent years, the Chinese government has devoted considerable effort to increasing enrolment and investment in TVET institutions.The Chinese government has addressed the affordability and accessibility of secondary TVET, aiming to attract more junior secondary graduates. National and local-level ministries coordinate enrollment expansion through financing, curriculum reforms, and policy support (Maruyama, 2020). It is worth mentioning that the policy derives from the Chinese government efforts to build better bridges between TVET and enterprises, for example, the policies increasingly frame TVET as critical for national modernization, linking enrollment targets to industrial upgrading and workforce demands. This has boosted the appeal of vocational pathways as a secure route to employment (Chen et al., 2024). These initiatives are consistent with the findings of this study. Although the development of TVET in Yunnan Province and even in China is relatively backward compared to that of developed countries in the West, however, the Chinese government as well as the education sector attaches great importance to the development of TVET institutions, the annual capital investment and student growth rate is not lower than that of developed countries. From 2010 to 2020, China implemented wide-reaching reforms that significantly expanded access to TVET, strengthened cooperation with industries, and improved the quality of instruction through ICT integration and teacher training programs. These reforms were particularly effective in economically advanced provinces like Guangdong and Zhejiang (Maruyama, 2020). Although the TVET organization faces many challenges in Yunnan Province China, it also brings many opportunities, and it is believed that in the near future, more Chinese students will be involved in learning and training with the TVET organization.

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APPENDIX A

Measurement Scale of Work Stability.

Indicator	ITEMS
Work stability	I worked for the same company for more than a year after graduation from TVET.
Work stability	My current job is a permanent contract (more than a year).
Work stability	The relevance of my work to my studies at the TVET organization is high.
Work stability	The skills I learned at the TVET organization can be adapted to new technological changes.
Work stability	I am confident in my current job.
Work stability	I think there are opportunities for advancement in my job.

Measurement Scale of TVET in Employability.

Indicator	ITEMS
Employability	I think skills developed on course have made me more employable.
Employability	I think experience of being a student has made me more employable.
Employability	I think subject i did is advantage in looking for employment.
Employability	I think experience of being a student has enhanced my social and intellectual.
Employability	I have the skills employers are looking for when recruiting for the kind of jobs I want.
Employability	I have the skills employers are likely to be looking for when recruiting for the kind of jobs for which I want to apply.

Measurement Scale of Job Satisfaction.

Indicator	ITEMS
Job Satisfaction	I receive adequate training and retraining in skill use for my job performance.
Job Satisfaction	I have adequate resources and equipment to carry out my duties.
Job Satisfaction	I have no fear of losing my job because of skill.
Job Satisfaction	My roles and duties are valued in my organization.
Job Satisfaction	I think the working conditions are satisfactory.
Job Satisfaction	I would recommend this profession as a good one.

Measurement Scale of Salary Status.

Indicator	ITEMS
Salary Status	I think the company that provides me with above average benefits
Salary Status	I think the company that has a retirement plan in which they would match my contribution.
Salary Status	I think the company that offers an above average or high starting salary for someone with diploma
Salary Status	I think TVET enables individuals with saleable skills to earn more than those without skills, thus improving their standard of living.
Salary Status	I think TVET empowers people with skills, knowledge, and attitude for improving their quality of life.
Salary Status	I think TVET empowers people with skills for self-employment thus improving their quality of life.