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Employability Skills and Career Adaptability Among TVET Students: What Matters?

Zixuan, Bai[1], Omar, Muhd Khaizer[1*] & Mohd Puad, Mohd Hazwan[1]

[1]Department of Science and Technical Education, Faculty of Educational Studies, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, MALAYSIA

*Corresponding author email: khaizer@upm.edu.my

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Abstract: This study investigates the correlation between employability skills and career adaptability among Technical and Vocational Education and Training (TVET) students in Taiyuan, Shanxi Province, China. As the number of graduates from Chinese universities and colleges continues to rise annually, the employment challenges confronting TVET students have become increasingly severe. Employing a quantitative correlational design, the study administered a questionnaire to 353 TVET students. The findings indicate that TVET students in Taiyuan demonstrate elevated levels of employability skills. Moreover, a positive correlation between employability skills and career adaptability was observed. The findings implies the role of academia in imparting the knowledge and skills essential for employability is paramount. By aiding TVET students in cultivating the skills demanded and valued by the industrial revolution, academia can play a pivotal role in shaping their prospective careers. This endeavour may aid in preparing TVET students in Taiyuan for employment and long-term career sustainability, facilitating swift adaptation to the evolving economy, and enhancing the quality of employment prospects.

Keywords: Employability skills, career adaptability, marketability, employment

1. Introduction

The term Technical and Vocational Education and Training (TVET), universally advocated by UNESCO (2015), encompasses a diverse array of educational, training, and learning activities aimed at preparing individuals for the demands of the workforce. UNESCO emphasizes the imperative for TVET programs to equip learners with the requisite knowledge and skills essential for employment, entrepreneurship, and ongoing learning endeavours. Typically, TVET integrates both theoretical understanding and practical proficiency relevant to specific industries, trades, or occupations. UNESCO indicates the significance of TVET in addressing global challenges such as unemployment, poverty, and economic development. As a highly specialized and practical discipline, TVET holds promise for the future. Positioned within the framework of lifelong learning and training, TVET commonly begins in secondary education and extends into higher education. The primary objective of TVET is to prepare young graduates for the realities of the job market, providing them with invaluable work-based learning experiences, technical expertise, and theoretical comprehension necessary for adapting to local employment landscapes (UNESCO, 2015).

The 21st century marks the era of the knowledge economy and the cultivation of talents (Xiao, 2010; González-Pérez & Ramírez-Montoya, 2022). Talent development is indispensable for ensuring the nation's survival by fostering and empowering human capital. This nurturing of talent occurs through skills empowerment via TVET-based programs, which place significant emphasis on hands-on and practical knowledge. TVET equips students with new skills crucial for their career advancement (Owais et al., 2020, p. 264).

In the context of modern economic and industrial development, TVET has emerged as a globally significant topic of concern. The conceptualization, content, and structure of TVET programs have undergone substantial evolution worldwide. The advancement of TVET in the Western world offers valuable insights for enhancing TVET in diverse regions. Due to its significance, the educational systems of numerous developed nations have deeply integrated TVET (Thelen, 2004; Trampusch, 2014).

A dual TVET system, which combines work-based and school-based training, holds considerable esteem in many industrialized nations, exemplified by Germany. This system is regulated and overseen by state-level labor market

*Corresponding author: khaizer@upm.edu.my

stakeholders, including employers and trade unions (Hall & Soskice, 2001). Moreover, TVET is available at various educational tiers, spanning secondary, college, and higher education, as it forms an integral component of lifelong learning. While in many countries, particularly developed ones, TVET is predominantly offered at the secondary school or college levels, it extends to the PhD level in numerous public institutions worldwide, alongside technical universities, polytechnics, and educational institutes.

In general, TVET facilitates the acquisition of a diverse skill set. Research indicates that, despite the competencies that TVET programs aim to impart, many graduates in developing nations require additional employability skills to secure employment (Akerele, 2007, p. 118; Yangben & Seniwoliba, 2014). Ayonmike (2014) suggests that the persistent demand from the job market for more relevant skills among TVET graduates might account for their perceived skill gaps.

1.1 Employment Arising in China

According to relevant data, there were approximately nine million university graduates in China in 2020, marking an increase of 350,000 compared to the previous year (Li et al., 2021). Consequently, the employment landscape has become more intricate, primarily due to an oversupply of graduates surpassing the demand (De Klerk et al., 2021). This new economic paradigm highlights the pressing need for TVET colleges to enhance the employability skills of their students (Mabunda & Frick, 2020). Factors such as the talent training programs of TVET colleges, the evolving employment criteria set by hiring enterprises, the deficiency in employability skills among many students, and the prevalence of outdated employment concepts and limited adaptability further compound the challenges students face in securing employment within TVET institutions.

Consequently, in 2006, the Chinese Ministry of Education identified TVET colleges as pivotal in addressing the challenge of graduate employment difficulties, emphasizing a targeted focus on students within these institutions. Thus, the overarching concern for TVET centers on enhancing graduates' core skills and overall quality, particularly in augmenting their employability skills and career adaptability. Presently, not all job opportunities in Taiyuan, Shanxi Province, face oversaturation. Numerous companies at various job fairs offer lucrative positions yet struggle to identify suitable candidates. Upon graduation and subsequent employment, students often encounter uncertainties regarding their roles within these companies. This predicament emphasises the imperative for clearer insight into prevailing job trends, refining teaching methodologies within TVET institutions, and enhancing governance at the ministry level. Bridging the gap between classroom instruction and practical application is essential. Consequently, students in TVET colleges necessitate bolstered employability skills to navigate their careers effectively (Li, 2022). Therefore, enhancing students' employability skills is crucial for their future career prospects. Moreover, students require a comprehensive understanding of TVET, which entails a clear sense of career direction and psychological preparedness to navigate competition while developing vocational adaptability. However, there remains a noticeable gap in fostering awareness regarding career choices and achieving a satisfactory level of vocational adaptability (Jia, 2020). Upon entering the workforce, wages for graduates of TVET colleges typically lag those of conventional university graduates and even fall below the earnings of certain migrant workers (Chen, 2022). Consequently, these students often resort to frequent job changes, resulting in a decline in the overall employment rate among TVET graduates.

This phenomenon demands an increased need to enhance the quality of employment opportunities. Overall, TVET institutions must prioritize the enhancement of their graduates' employability skills and career adaptability. Understanding the current situation and challenges regarding college students' employability skills is crucial, starting at the individual level to ensure that students receiving technical and vocational education can secure their desired jobs. Addressing the root causes of employment challenges for university students in Taiyuan is essential. This comprehensive approach aims to foster employment opportunities for TVET students effectively. To summarize, the study formulated the following objectives to guide its direction: (a) identifying the level of employability skills and career adaptability among TVET college students in Taiyuan city, and (b) determining the relationship between employability skills and career adaptability in meeting the demands of the workforce.

1.2 Employability Skills of TVET Students

Employability skills have been extensively studied over the past few decades due to their crucial importance in recent job placement. Possessing employability skills is considered a prerequisite before entering employment, as it enables individuals to meet market demands and adapt to economic changes. However, despite the abundance of graduates, employers often criticize the lack of employability skills among them, which can have detrimental effects (Jollands et al., 2015). Employers seek graduates who are thoroughly prepared for the job and capable of weathering economic recessions. Numerous studies in the literature have highlighted deficiencies in employability skills among graduates entering their first job placements (see Ausman, 2008; Carnevale & Smith, 2013; and Klimplová, 2012).

Discrepancies between graduate employability skills needs and actual skills are evident. The Graduate Employability skills Blueprint (2012-2017) identifies specific industry requirements, including a strong command of English, a positive attitude, and problem-solving skills (Goon, 2014). High graduate unemployment rates indicate that many graduates need to gain these essential competencies. Quek (2005) also asserts that a lack of teamwork, creativity, and problem-solving abilities contributes to graduate unemployment. These findings align with a JobStreet.com (2018) survey, which

identifies weak character, attitude, or personality (58%) and insufficient English language proficiency (52%) as leading contributors to unemployment.

The employability skills of TVET students is typically defined from narrow and broad perspectives. The narrow view emphasizes competencies essential for specific future careers, such as acquiring job information, analysing job descriptions, and submitting applications effectively (Hu, 2015). This perspective underscores the crucial transition TVET students undergo from school to the professional world, requiring competencies like communication, professional knowledge, comprehensive qualities, career planning, critical thinking, information gathering, and interpersonal skills.
TVET employability skills extends beyond job searching and includes maintaining employment successfully. This broader perspective incorporates a strong foundation in professional knowledge, extensive social practice experience, outstanding overall quality, exceptional interpersonal skills, and a strong value system. These attributes align with future job-related requirements (Hu, 2015). The broader view of TVET employability skills encompasses the ability to adapt to evolving career requirements and a commitment to lifelong learning. TVET students are expected to effectively align their competencies with their careers' changing needs and develop their professional trajectories. This perspective emphasizes the willingness to engage in continuous learning based on TVET students' competencies, matching these competencies with job demands and timely career development.TVET students should prioritize various employability skills skills, including social skills, engineering domain knowledge, communication skills, information and technology skills, management skills, creativity and innovation, problem-solving abilities, and critical thinking. These skills enhance TVET students' readiness for diverse career opportunities (Nugraha et al., 2020

1.3 Career Adaptability

Career adaptability is a concept explored through diverse lenses in distinct academic fields, each providing a unique perspective. The Encyclopaedia of Counselling (2001) defines career adaptability as the extent to which an individual's circumstances align with the demands of their occupation and career environment. This perspective emphasizes the importance of a harmonious fit between an individual's conditions and occupational requirements.

From a social theory perspective, Yuan (2000) presents career adaptability as an integral part of an individual's ongoing socialization process. In this context, it is viewed as the socialization of workers, highlighting its role in shaping individuals as they navigate their careers within broader societal contexts. In human resource management theory, career adaptability is essential for job performance. It encompasses psychological and physical attributes shaped by intrinsic factors and the external environment. This perspective underscores the interconnectedness of an individual's details and the influence of their work environment on their career adaptability. Contemporary discussions on vocational education emphasize the need for adaptability in the face of social and technological changes. Governments, enterprises, and efficiency initiatives actively explore ways to enhance vocational education adaptability.

Liu (2023) characterizes career adaptability as how an individual aligns with job and career development requirements after entering the workplace. A higher alignment is

correlated with better adaptive performance. The unpredictable nature of adaptability before engaging in a specific occupation highlights the importance of career preparation and ongoing efforts by individuals to enhance their adaptability as they progress in their careers.

Career adaptability serves as a framework for individuals to envision their future career paths and supports tailored treatment based on individual needs. In the rapidly changing economic landscape, individuals must adapt quickly to various work environments and frequent job shifts to thrive (Monteiro et al., 2019). He (2004) defines career adaptation as the process and outcome of an individual's adjustment to work tasks, environment, and interpersonal relationships. This perspective highlights the importance of mutual coordination and organic integration of individuals and their occupations within organizations. Li and Ren (2020) introduce the concept of career adaptive training, a "human-centered" approach that integrates science and technology development with societal needs. This approach focuses on training students in competencies and qualities aligned with technological trends for long-term career development.

2. Methodology

This research employed a quantitative correlational design. Data were collected through a set of questionnaires, serving as a tool to gather information on participants' employability skills and career adaptability. The study population comprised fifteen technical vocational colleges in Taiyuan City, Shanxi Province, China, totalling 3,019 individuals from the 2023 class of TVET college graduates (Taiyuan Education Department, 2023). From this population, a sample of 353 students from technical and vocational colleges in Taiyuan City was selected for the survey. The questionnaires were distributed to the selected sample. A Likert scale questionnaire served as the study's instrument, assessing respondents' agreement with a series of statements. The questionnaire was administered anonymously, and responses were scored on a scale of 1 to 5 based on the level of agreement. In total, the questionnaire consisted of 49 items. The first section consists of demographic information and comprises two questions. The second section features the employability skills questionnaire, comprising 23 questions. The employability skills questionnaire measures five dimensions: complex problem-solving, critical thinking, creativity, people management, and coordinating with others. The final section contains the career adaptability questionnaire, which includes 24 questions. It assesses four dimensions of students' career

adaptability: concern, control, curiosity, and confidence. Eighty-two graduates from technical and vocational colleges in Taiyuan City in 2023 were selected for a pilot study. Table 1 indicates that the reliability coefficient value is 0.949, exceeding 0.9, thus indicating a high level of reliability for the overall items in the study. Furthermore, it was reported that the reliability coefficient does not significantly increase when any question item is deleted, suggesting that no question item should be removed from the questionnaire form.

Table 1. Cronbach's Reliability Analysis

Number of items	Sample size	Cronbach's α coefficient
47	82	0.949

3. Results and Findings

The demographic information section identifies the respondents and indicates whether they are students of the technical and vocational college in Taiyuan. It also aims to ascertain whether the respondents are currently employed or not. The report is presented in table 2.

Table 2 Frequency analysis results

Did you graduate from a TVET college in Taiyuancity?				
	Frequency	Percentage	Effective percentage	Cumulative percentage
Yes	353	100.0	100.0	100.0
Do you have a job now?				
Yes	353	100.0	100.0	100.0

3.1 Level of Employability Skills

The first objective of this study is to determine the level of employability skills among students enrolled in the Technical and Vocational Colleges of Taiyuan City. A summary of the descriptive statistics, including mean, standard deviation, and level, is presented in Table 3. The overall mean employability skills score was 3.85, with a standard deviation of 0.64. Higher mean scores indicate a higher level of employability skills among the students investigated in this study.

The measurement of employability skills encompasses five dimensions: complex problem-solving, critical thinking, creativity, people management, and coordinating with others. As illustrated in the table, the dimension with the highest level of performance is complex problem-solving (M=4.03, SD=0.92). Following this, creativity demonstrates a high level of performance (M=3.96, SD=0.85). Moderately performing competencies include coordinating with others (M=3.89, SD=0.83), while critical thinking shows a mean performance level of 3.72, with a standard deviation of 0.90. In this study, the competency with the lowest performance level is people management (M=3.66, SD=0.95).

Table 3. Level of Employability skills according to overall dimension (n=353)

Employability skills	Mean	Standard deviation	Level
Complex problem-solving	4.03	.92	High
Critical thinking	3.72	.91	High
Creativity	3.96	.85	High
People management	3.66	.95	Moderate
Coordinating with others	3.89	.83	High

The dimension of complex problem-solving is assessed through four items. According to the findings presented in Table 4, 35 respondents (9.9% of the total 353) rated this dimension as low. Among these, 40 respondents (11.3%) perceived as moderate. A significant majority of 278 respondents (78.8%) rated high. Overall, the study indicates a very high-performance level in complex problem-solving (M=4.03, SD=0.92).

The dimension of critical thinking is evaluated through five items. As per the data in Table 4, 36 respondents (10.2% of the total 353) rated this dimension as low. Among them, 87 respondents (24.6%) assessed this dimension as moderate. The majority of 230 respondents (65.2%) rated high. Overall, the study suggests a high-performance level in critical thinking (M=3.72, SD=0.91).

The dimension of creativity ability is measured by five items. According to the results in Table 4. 19 (5.4%) out of a total of 353 respondents rated this dimension as low. Of these, 69 (19.5%) respondents rated this dimension as moderate. There were 265 (75.1%) respondents who rated high. Overall, the study found that the level of performance of the ability to creativity was high (M=3.96, SD=0.85).

The dimension of people management ability is measured by four items. According to the results in Table 4. 56 (15.9%) out of a total of 353 respondents rated this dimension as low. Of these, 88 (24.9%) respondents rated this dimension as moderate. There were 209 (59.2%) respondents who rated highly. It is, however, the study found that the level of performance of the ability to people management was moderate (M=3.66 SD=0.95).

The dimension of coordinating with others ability is measured by four items. According to the results in Table 4. 24 (6.8%) out of a total of 353 respondents rated this dimension as low. Of these, 72 (20.4%) respondents rated this dimension as moderate. There were 257 (72.8%) respondents who rated high. Overall, the study found that the level of performance of the ability to coordinating with others was high (M=3.89, SD=0.83).

Table 4. Level of Employability skills (n=353)

Level	n	%	M	SD
Complex problem solving				
Low (1.00-2.339)	35	9.9	4.01	.92
Moderate (2.34-3.669)	40	11.3		
High (3.67-5.00)	278	78.8		
Critical thinking				
Low (1.00-2.339)	36	10.2	3.72	.91
Moderate (2.34-3.669)	87	24.6		
High (3.67-5.00)	230	65.2		
Creativity				
Low (1.00-2.339)	19	5.4	3.96	.85
Moderate (2.34-3.669)	69	19.5		
High (3.67-5.00)	265	75.1		
People management				
Low (1.00-2.339)	56	15.9	3.66	.95
Moderate (2.34-3.669)	88	24.9		
High (3.67-5.00)	209	59.2		
Coordinating with others				
Low (1.00-2.339)	24	6.8	3.89	.83
Moderate (2.34-3.669)	72	20.4		
High (3.67-5.00)	257	72.8		
Overall			**3.85**	**.64**

3.2 Level of Career Adaptability

The second objective of this study is to assess the level of career adaptability among students in technical and vocational schools in Taiyuan City. Table 5 presents a summary of the descriptive statistics for career adaptability. Notably, the overall score for career adaptability indicates high mean and standard deviation values (M = 3.79, SD = 0.64).

Career adaptability comprises four dimensions: concern, control, curiosity, and confidence. As depicted in the table, the dimension of control exhibits the highest mean score (M = 4.03, SD = 0.82), indicating a strong level of performance. Following this, concern demonstrates a relatively high level of performance (M = 3.81, SD = 0.86). Curiosity displays a moderate level of performance (M = 3.71, SD = 0.86). Conversely, confidence emerges as the domain with the lowest level of performance in the study (M = 3.62, SD = 0.98). These findings suggest that the 353 students who participated in the study exhibit a need for improvement in confidence regarding career adaptability.

Table 5. Level of Career adaptability according to overall dimension (n=353)

Career adaptability	Mean	Standard deviation	Level
Concern	3.81	.86	High
Control	4.03	.82	High
Curiosity	3.71	.86	High
Confidence	3.62	.98	Moderate

The dimension of concern is measured by six items. According to the results in Table 6, 21 (5.9%) out of a total of 353 respondents rated this dimension as low. Of these, 97 (27.5%) respondents rated this dimension as moderate. There were 235 (66.6%) respondents who rated high. Overall, the study found that the level of performance of the ability to concern was high M=3.81, SD=0.86).

The dimension of control is measured by six items. According to the results in Table 6, 15 (4.3%) out of a total of 353 respondents rated this dimension as low. Of these, 70 (19.8%) respondents rated this dimension as moderate. There were 268 (75.9%) respondents who rated high. Overall, the study found that the level of performance of the ability to control was high (M=4.03, SD=0.82).

The dimension of curiosity is measured by six items. According to the results in Table 6, 30 (8.5%) out of a total of 353 respondents rated this dimension as low. Of these, 110 (31.2%) respondents rated this dimension as moderate. There were 213 (60.3%) respondents who rated high. All in all, the study found that the level of curiosity was high (M=3.71, SD=0.86).

The dimension of confidence is measured by six items. According to the results in Table 6, 55 (15.6%) out of a total of 353 respondents rated this dimension as low. Of these, 82 (23.2%) respondents rated this dimension as moderate.

There were 216 (61.2%) respondents who rated high. However, the study found that the level of overall performance of the confidence was moderate (M=3.62, SD=0.98).

Table 6. Level of Career adaptability (n=353)

Level	n	%	M	SD
Concern				
Low (1.00-2.339)	21	5.9	3.81	.86
Moderate (2.34-3.669)	97	27.5		
High (3.67-5.00)	235	66.6		
Control				
Low (1.00-2.339)	15	4.3	4.03	.82
Moderate (2.34-3.669)	70	19.8		
High (3.67-5.00)	268	75.9		
Curiosity				
Low (1.00-2.339)	30	8.5	3.71	.86
Moderate (2.34-3.669)	110	31.2		
High (3.67-5.00)	213	60.3		
Confidence				
Low (1.00-2.339)	55	15.6	3.62	.98
Moderate (2.34-3.669)	82	23.2		
High (3.67-5.00)	216	61.2		
Overall			3.79	.64

3.3 Relationship between Employability Skills and Career Adaptability

This section also explains the findings of the third objective in this study, which is to determine the relationship between the independent variables and dependent variables of the study. So, this part will verify the relationship between employability skills and career adaptability. Based on the Table 7 below, the correlation analysis is used to investigate the correlation between career adaptability and complex problem solving, critical thinking, creativity, people

management, coordinating with others. And the Pearson correlation coefficient is used to indicate the strength of the correlation. The specific analysis shows that there is a statistically significant relationship between employability skills and career adaptability. There is a positive correlation between employability skills and career adaptability, r=0.731, p < .01.

There is a statistically significant relationship between complex problem-solving and career adaptability. There is a positive correlation between complex problem-solving and career adaptability, r=0.592. An increase in complex problem-solving is strongly correlated with an increase in career adaptability, r = 0.592, p < .01.

There is a statistically significant relationship between critical thinking and career adaptability. There is a positive correlation between critical thinking and career adaptability, r=0.464. An increase in critical thinking is moderately correlated with an increase in career adaptability, r =0.464, p < .01.

There is a statistically significant relationship between creativity and career adaptability. There is a positive correlation between creativity and career adaptability, r=0.519. An increase in creativity is strongly correlated with an increase in career adaptability, r = 0.519, p < .01.

There is a statistically significant relationship between people management and career adaptability. There is a positive correlation between people management and career adaptability, r=0.523. An increase in people management is strongly correlated with an increase in career adaptability, r = 0.523, p < .01.

There is a statistically significant relationship between coordinating with others and career adaptability. There is a positive correlation between coordinating with others and career adaptability, r=0.507. An increase in coordinating with others is strongly correlated with an increase in career adaptability, r = 0.507, p < .01.

Table 7. Correlation matrix between dimension of sources of career adaptability and employability skills

*. At the 0.01 level (2-tailed), the correlation is significant.

	Career adaptability	**Complex problem-solving**	**Critical thinking**	**Creativity**	**People management**	**Coordinating with others**
Career adaptability	1					
Complex problem-solving	0.592**	1				
Critical thinking	0.464**	0.436**	1			
Creativity	0.519**	0.421**	0.369**	1		
People management	0.523**	0.433**	0.327**	0.432**	1	
Coordinating with others	0.507**	0.428**	0.325**	0.347**	0.326**	1

3.4 Regression Analysis of Employability and Career Adaptability

Based on the regression analysis above, the following conclusions can be drawn. The premise of linear regression is that there must be a correlation between variables. In the "Summary of Regression Analysis Model", the R-value is 0.731, indicating a moderate correlation between career adaptability level X (independent variable) and employability level Y (dependent variable).

In the analysis of variance table, the P-value in "ANOVA" is 0.000<0.05, indicating that there is a significant linear regression relationship between at least the independent variable X and Y. Therefore, the regression model has statistical significance.

In the regression coefficient table, the corresponding values of t = 0.000 ＜ 0.05, indicating a significant correlation between the independent variable and the dependent variable, and the regression coefficient is effective. According to the coefficient table 'non standardized coefficients', the regression equation can be obtained: Y=1.11+0.72X.

Table4.8 Regression analysis results (n=353)

Model Summary

Model	R	R^2	Adjusted R^2	Errors in standard estimation
1	.731	.534	.533	.43448

a: Predictive variables: (constant), Career adaptability

ANOVA[a]

Model		Sum of squares	Degrees of Freedom	Mean square	F	Sig.
1	Regression	75.994	1	75.994	402.579	.000[b]
	Residual	66.258	351	.189		
	Total	142.252	352			

a. Dependent variable: Employability
b. Predictive variables: (constant), Career adaptability

Coefficients

		Unstandardized coefficient		Standardization coefficient		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.105	.139		7.958	.000
	Career adaptability	.724	.036	.731	20.064	.000

a. Dependent variable: Employability skills

Residuals Statistics

	Minimum value	Maximum value	Mean	Standard deviation	Number of cases
Predictive value	2.0405	4.6057	3.8520	.46464	353
Residual	-1.54925	1.10181	.00000	.43386	353
Standard predicted value	-3.899	1.622	.000	1.000	353
Standardized residual	-3.566	2.536	.000	.999	353

4. Discussion

This research reveals that students of technical and vocational colleges in Taiyuan city possess a high level of employability skills. According to Sakamoto and Sung (2018), employability skills serve as a vital indicator of employees' adaptability to meet the evolving demands of the workplace. Additionally, Park and Park (2020) argue that adaptability is crucial for navigating changes effectively, with employable individuals actively engaging in the labor market.

The mean value of employability skills among students of technical and vocational colleges in Taiyuan city in this study is 3.85, indicating a high level of proficiency. The questionnaire survey data encompassed five dimensions of employability skills among students of Taiyuan Technical and Vocational College. Notably, the level of people management skills falls within the moderate range. Statistical findings suggest that students in technical vocational education should focus on improving their ability to manage interpersonal relationships, as this deficiency may hinder their job adaptation and integration into enterprise work environments. Furthermore, students in technical vocational schools generally require training in handling interpersonal dynamics in the workplace (Shan, 2020).

The mean value of career adaptability of students of technical and vocational colleges in Taiyuan city is at high level. According to the results of the data from the questionnaire, four dimensions were included in the survey on the career adaptability of the students of Taiyuan Technical and Vocational college. The averages for three areas are at a high level. Confidence are at moderate level. The most significant differences in test values were found for control and confidence. The data from the study showed that the students surveyed needed to increase their confidence level to enable them to

overcome the barriers that arose when attempting to achieve their career goals. Improving confidence in career is a gradual process that may take time and effort.

This study also concluded that there were noteworthy relationships between employability skills and career adaptability. These findings are consistent with previous research on career construct theory, which suggests a positive correlation between indicators of career adaptability, career resources, and subjective career success (Hossain et al., 2020; Monteiro et al., 2019). The relationship between complex problem solving, critical thinking, creativity, people management and coordinating with others among career adaptability was positively correlated. In addition, all four dimensions of career adaptability were positively correlated with complex problem-solving, critical thinking, creativity, people management, and coordination with others.

Previous studies suggest that employability skills equip individuals with a diverse range of competencies crucial for navigating evolving career landscapes. Individuals with robust employability skills are better equipped to confront career challenges, such as technological advancements or economic shifts, and adeptly navigate them (Fugate et al., 2004). This corroborates the role of employability skills as a facilitator of career adaptability. Characterized by resilience and flexibility, career adaptability enhances an individual's employability skills. A person with high career adaptability is more likely to engage in proactive planning, explore new career paths, and pursue their career goals with confidence (Zacher, 2015). These proactive behaviors contribute to the development of greater employability skills, ensuring individuals remain competitive and adaptable in the job market.

The relationship between employability skills and career adaptability is dynamic and symbiotic. Employability skills contribute to an individual's career adaptability by providing them with the tools needed to navigate the complexities of the job market. Conversely, career adaptability enhances employability skills by fostering proactive career behaviors and resilience. Understanding the reciprocal influence of these constructs is crucial for individuals, educators, policymakers, and employers seeking to foster career success and adaptability in an increasingly dynamic job market.

The study's findings highlight a robust correlation between graduates' employability skills, self-efficacy, and capacity for career flexibility (Ismail, 2017). These findings are supported by Potgieter (2012), who suggested that individuals with solid self-esteem are more likely to demonstrate employability skills compared to those with poor self-esteem. Additionally, Tolentino et al. (2013) noted a positive correlation between self-esteem and career adaptability in their research. Moreover, Coetzee et al. (2015) and de Guzman & Choi (2013) found that graduate employability skills are higher among individuals with high levels of career adaptability.

Few studies have demonstrated that career adaptability mediates the relationship between employability skills and career success (Hossain et al., 2020). This mediation suggests that employability skills partially contribute to career success by influencing career adaptability. Career adaptability acts as a conduit, translating employability skills into tangible career outcomes. Recognizing the significance of both employability skills and career adaptability, organizations increasingly invest in training and development programs aimed at enhancing these competencies simultaneously (Wen et al., 2019). Such initiatives empower employees to excel in their current roles, prepare for future career transitions, and thrive in an ever-evolving work environment.

It is necessary to build a perfect mechanism for cultivating interpersonal communication ability and integrate the cultivation of interpersonal communication into the whole process of employment guidance. Given the lack of attention to the cultivation of interpersonal management ability for employment in employment guidance, technical and vocational colleges should establish a perfect system to clarify the status of the cultivation of interpersonal management ability for employment and highlight the systematic nature of interpersonal cultivation. For example, colleges and universities should integrate the cultivation of interpersonal management ability for employment with the employment guidance system to improve students' comprehensive quality.

TVET students' perceptions of their employability skills and educational goals directly impact their state of mind when choosing a career. Their greater adaptability enhances the ability to make the right career decisions and improve all aspects of their work as technical and vocational education college students. Therefore, as stated in this study, it is essential to develop the correct concept of employment, improve practical experience, and develop the general competencies of technical and vocational students. Therefore, enhancing the employability skills and career development of technical and vocational college students is essential.

The emergence of Industry 4.0 requires more activities to identify industry trends, job demands, and opportunities that may emerge alongside this revolution to significantly increase the potential for skills development aligned with the fourth industrial revolution. According to Muktiarni et al. (2019) and Halili and Sulaiman (2021), all sectors, including education, the growth of Industry 4.0, and the new technological paradigm, will impact the industry.

Young people understand that they must be accountable for their career growth and employability skills. To improve their prospects of landing and keeping a good, long-term job, emphasis is being placed on developing graduate employability skills and the capacity to adjust to the demands of modern work (Bezuidenhout, 2011; Savickas & Porfeli, 2012). The employability skills of young individuals is enhanced by their career resilience, graduate employability skills, and self-esteem. These attributes also help organisations achieve and sustain a competitive advantage in the volatile labour market (Coetzee et al., 2015; Ismail et al., 2017).

It is of great significance to strengthen the interpersonal management of college graduates' employment to enhance job adaptability, improve students' employability skills, and improve the social influence of colleges and universities.

Therefore, under the increasingly difficult employment situation, technical vocational colleges and universities must pay more attention to the cultivation of students' interpersonal management ability for employment: firstly, technical and vocational college administrators should attach great importance to the cultivation of students' people management ability for employment, and put the cultivation of people management ability on an equal footing with academic education, to improve the cognitive ability of students' cultivation of people management ability, and ultimately urge students to have the people communication ability that is suitable for the workplaces. The students are urged to have people management suitable for their workplaces.

It has been demonstrated that these career adaptability factors reflect the overall adaptive techniques and resources required for many professional transitions during a lifetime (Savickas, 2013). The degree to which workers are proactive and future-focused in preparing for forthcoming career duties and problems is called career concern (Savickas & Porfeli, 2012). Being concerned about one's future necessitates being aware, involved, organised, and adaptable (Savickas, 2013). Career control refers to how a worker accepts accountability for shaping their professional growth and environment through diligence, self-control, and resolve (Savickas & Porfeli, 2012).

People who lack a strong sense of control over their careers may need to be more confident at work and adapt to the demands of the modern workplace (Coetzee et al., 2015; Del Corso, 2013). According to Savickas and Porfeli (2012), career curiosity entails considering how one's potential future self and possibilities might impact different job roles and circumstances. People must be risk-takers, adventurous, and curious to adjust to workplace changes (Savickas, 2013).

According to Savikas and Porfeli (2012), career confidence is the conviction that one can effectively navigate barriers and realise one's professional aspirations. People's career confidence is demonstrated by how they manage the pressures in their lives, both emotionally and professionally (Del Corso, 2013). Relevant to previous research theories, the following study findings corroborate this: Students' employability skills are more readily demonstrated by people with solid self-esteem than by those with poor self-esteem (Potgieter, 2012). Self-esteem and career adaptability are positively correlated (Tolentino et al., 2013). Graduate employability skills is higher in those with high career adaptability levels (Coetzee et al., 2015; de Guzman & Choi, 2013).

5. Conclusion

In summary, the level of employability skills and career adaptability among TVET students in Taiyuan City, China, is high. Moreover, there exists a positive relationship between employability skills and career adaptability among Technical and Vocational College Students in Taiyuan City, China. This positive correlation determines the pivotal role of the skills required for Industry 4.0 in shaping the subjective career success of Technical and Vocational college students in Taiyuan city.

In addition to academia's responsibility in imparting the necessary knowledge and skills for employability, universities can potentially aid technical-vocational school students in fostering their future careers. This assistance may include equipping students with the skills valued in Industry 4.0 and providing resources for self-regulation of attention, control, curiosity, and self-confidence prior to graduation. Such initiatives could effectively prepare students at Taiyuan Technical and Vocational College for employment opportunities and long-term success in their chosen career paths.

In the fast-moving industrial age, keeping up-to-date with job knowledge and skills is necessary to keep up with rapidly changing economic conditions. Universities can help and encourage technical-vocational college students to engage and remain in productive employment while developing essential skills and honing self-regulatory mechanisms to connect and respond to career changes.

This study highlights the importance of career adaptability in enabling young people to cope with the constant changes and demands of the 21st-century world of work. Developing career adaptability and graduate employability skills can help young graduates cope with the uncertainty of the workplace while improving their employability skills. This will help improve students' employment in technical vocational schools in the Taiyuan region of China. Career counsellors must focus on helping young people improve student employability skills, career exploration, or career adaptability to help them build successful careers.

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References

Akerele, W.O. (2007). Management of technical and vocational education in Nigeria: the challenges of the country. *Journal of Research in Education and Society*. *1*(2&3), 117- 124.

Ausman, T. (2008). Career readiness credential: assessing and improving workforce skills to meet the needs of employers in the information age. In *Distance learning (Greenwich, Conn.)* (Vol. 5, Issue 1, pp. 19-). Information Age Publishing, Inc.

Ayonmike, S. (2014). Challenges in Implementing the TVET Curriculum in Technical Colleges in Southern Nigeria. *Makerere Journal of Higher Education, 6*(1), 87 – 97.

Bezuidenhout, M. (2011). *The development and evaluation of a measure of graduate employability in the context of the new world of work.* ProQuest Dissertations Publishing.

Carnevale, A. P., & Smith, N. (2013). Workplace basics: the skills employees need and employers want. *Human Resource Development International,16*(5), 491–501. https://doi.org/10.1080/13678868.2013.821267

Chen, Sh. (2022). Analysis of Employability of Students in Higher Vocational Colleges and Suggestions for Improvement Initiatives. *Journal of Hunan Institute of Industrial Vocational Technology,* (05), 119-123. https://doi.org/10.13787/j.cnki.43-1374/z.2022.05.029.

Coetzee, M., Ferreira, N., & Potgieter, I. L. (2015). Assessing employability capacities and career adaptability in a sample of human resource professionals. *SA Journal of Human Resource Management*, *13*(1), 1-e9. https://doi.org/10.4102/sajhrm.v13i1.682

de Guzman, A. B., & Choi, K. O. (2013). The relations of Employability Skills to career adaptability among Technical School Students. *Journal of Vocational Behavior*, *82*(3), 199–207. https://doi.org/10.1016/j.jvb.2013.01.009

Del Corso, J., & Rehfuss, M. C. (2011). The role of narrative in career construction theory. *Journal of Vocational Behavior*, *79*(2), 334–339. https://doi.org/10.1016/j.jvb.2011.04.003

Fugate, M., Kinicki, A. J., & Ashforth, B. E. (2004). Employability: A psycho-social construct, its dimensions, and applications. *Journal of Vocational Behavior, 65*(1), 14–38. https://doi.org/10.1016/j.jvb.2003.10.005

González-Pérez, L. I., & Ramírez-Montoya, M. S. (2022). Components of Education 4.0 in 21st Century Skills Frameworks: Systematic Review. *Sustainability (Basel, Switzerland), 14*(3), 1493-. https://doi.org/10.3390/su14031493

Goon, J. (2014). Three E's to employability. The StarOnline, January 26, 2014. Retrieved March 1 2023 from http://www.thestar.com.my/News?education/2014/01/26/Three-E's-to-employability

Halili, S. H., Sulaiman, S., Sulaiman, H., & Razak, R. (2021). Embracing industrial revolution 4.0 in universities. *IOP Conference Series. Materials Science and Engineering*, *1088*(1), 12111-. https://doi.org/10.1088/1757-899X/1088/1/012111

Hall, P. A., & Soskice, D. W. (2001). *Varieties of capitalism: The Institutional Foundations of Comparative Advantage*. Oxford University Press.

He, X. R. (2004). Across the workplace. *Beijing: Higher Education Press,* 114.

Hossain, M. S., Rahman, M., Jahan, N., & Islam, M. (2020). Career adaptability and employability skills: A study on university graduates. *Journal of Career Development, 47(*4), 411-425.

HR In Asia (2018). Poor command of English among major reasons for graduates unemployment in Malaysia. Retrieved February 2nd, 2024 from https://www.hrinasia.com/recruitment/poor-command-of-english-among-major-reasons-for-graduates-unemployment-in-malaysia/

Hu, Sh. N (2015). Undergraduate Employability Cultivation Problems and Countermeasures Research Master's Thesis, Shanxi University of Finance and Economics.

Ismail, S. (2017). Graduate employability capacities, self-esteem and career adaptability among South African young adults. *SA Journal of Industrial Psychology*, *43*(1), 1–10. https://doi.org/10.4102/sajip.v43i0.1396

Jia, X. B.(2005). The current situation of college students' vocational adaptability development and employability training. *Journal of Tianjin Normal University (Social Science Edition),* (03), 68-73.

Jollands, M. (2015). A framework for graduate employability adapted for discipline differences. *In Learning for Life and Work in a Complex World: 38th Higher Education Research and Development Society of Australasia (HERDSA) Annual International Conference* (pp. 1-10)'[

Klimplova, L. (2012). Employers' View on Problems Related to Workforce Skills and Qualification. *Journal of Competitiveness,4*(4), 50–66. https://doi.org/10.7441/joc.2012.04.04

Li, R. M.,& Ren, Z.Q.(2020). Vocational colleges and universities based on vocational adaptability orientation Intelligent manufacturing talent training. *Education and Career,* 52-57.

Liu, J. S. (2023). Exploring the path of career adaptation of young teachers in higher education institutions. *Liaoning Journal of Higher Education,* (01), 79–82.

Lu, Y. (2019). Research on Vocational and technical education development in China in the new era - Review of Vocational and Technical Education. *News Enthusiast,* (12), 108–109. https://doi.org/10.16017/j.cnki.xwahz.2019.12.031.

Mabunda, N. O., & Frick, L. (2020). Factors that influence the employability of National Certificate (Vocational) graduates : the case of a rural TVET college in the Eastern Cape province, South Africa. *Journal of Vocational, Adult and Continuing Education and Training*, *3*(1), 89–108. https://doi.org/10.14426/jovacet.v3i1.127

Monteiro, S., Taveira, M. do, & Almeida, L. (2019). Career Adaptability and University-to-Work Transition: Effects on Graduates' Employment Status. *Education & Training (London)*, *61*(9), 1187–1199. https://doi.org/10.1108/ET-10-2018-0206

Muktiarni, M., Widiaty, I., Abdullah, A. G., Ana, A., & Yulia, C. (2019) Digitalisation trend in education during industry 4.0. *Journal of Physics: Conference Series*, *1402*(7), 077070. https://doi.org/10.1088/1742-6596/1402/7/077070

Nugraha, M. R. B., Widaningsih, L., & Megayanti, T. (2021, February). The Influence of Perception About Working World Information Based on Student Work Readiness at SMK Negeri 1 Sumedang. In *6th UPI International Conference on TVET 2020 (TVET 2020)* (pp. 181-185). Atlantis Press.

Owais, A. K., Alabidi, S. M., Hatamleh, Z. M., & Hussein, E. T. (2020). Technical and vocational education and training in the UAE. *International Journal of Emerging Technologies in Learning (iJET)*, *15*(13), 264. https://doi.org/10.3991/ijet.v15i13.13801

Park, S., & Park, S. Y. (2020). Career adaptability of South Korean engineering students. *European Journal of Training and Development*, *44*(4/5), 469–488. https://doi.org/10.1108/ejtd-10-2019-0181

Potgieter, I. (2012). The relationship between the self-esteem and employability attributes of postgraduate business management students. *SA Journal of Human Resource Management*, *10*(2), e1–e15. https://doi.org/10.4102/sajhrm.v10i2.419

Sakamoto, A., & Sung, J. (Eds.). (2018). *Skills and the future of work: Strategies for inclusive growth in Asia and the Pacific*. ILO Regional Office for Asia and the Pacific.

Savickas, M. L. (1997). Career adaptability: An integrative construct for life-span, life-space theory. *The Career Development Quarterly*, *45*(3), 247–259. https://doi.org/10.1002/j.2161-0045.1997.tb00469.x

Savickas, M. L. (2008). Helping people choose jobs: A history of the guidance profession. *International Handbook of Career Guidance*, 97–113. https://doi.org/10.1007/978-1-4020-6230-8_5

Savickas, M. L. (2016). Reflection and reflexivity during life-design interventions: Comments on career construction counseling. *Journal of Vocational Behavior*, *97*, 84–89. https://doi.org/10.1016/j.jvb.2016.09.001

Savickas, M. L., Nota, L., Rossier, J., Dauwalder, J.-P., Duarte, M. E., Guichard, J., Soresi, S., Van Esbroeck, R., & van Vianen, A. E. M. (2009). Life designing: A paradigm for career construction in the 21st Century. *Journal of Vocational Behavior*, *75*(3), 239–250. https://doi.org/10.1016/j.jvb.2009.04.004

Shan, L. H. (2020). The application method of interpersonal communication psychological effect in ideological and political education and management of college students. *Think Tank Times*, (05), 156-157.

Shen, S. H. (2010). *The construction of a system for cultivating students' vocational adaptability in higher education.* Master's thesis, Shanxi University of Finance and Economics.

Thelen, K. A. (2004). *How institutions evolve : the political economy of skills in Germany, Britain, the United States, and Japan*. Cambridge University Press.

Tolentino, L. R., Garcia, P. R. J. M., Restubog, S. L. D., Bordia, P., & Tang, R. L. (2013). Validation of the Career Adapt-Abilities Scale and an examination of a model of career adaptation in the Philippine context. *Journal of Vocational Behavior*, *83*(3), 410–418. https://doi.org/10.1016/j.jvb.2013.06.013

Trampusch, C. (2014). Collective skill formation: A historical analysis of the least-likely case New Zealand. *Journal of Vocational Education and Training,* 66 (2), 135–155.

UNESCO (2016). Recommendation concerning Technical and Vocational Education and Training (TVET), 2015. Retrieved January 12th, 2024 from https://unesdoc.unesco.org/ark:/48223/pf0000245178.locale=en

UNESCO (2015). Proposal for the revision of the 2001 revised recommendation concerning Technical And Vocational Education. https://doi.org/10.1163/ej.9789004164543.1-0.68

Wen, Z., Ma, L., Liu, Q., & Hou, Y. (2019). How career adaptability influences job crafting among Chinese employees: A moderated mediation model. *Frontiers in Psychology*, *10*, 2140.

Xiang, B., Wang, H., & Wang, H. (2023). Is There a Surplus of College Graduates in China? Exploring Strategies for Sustainable Employment of College Graduates. *Sustainability (Basel, Switzerland)*, *15*(21), 15540-. https://doi.org/10.3390/su152115540

Xiao, T. (2009). Research on the post-employment career adaptability problems and employability cultivation of higher vocational graduates. *Education Modernization*, 5(42), 312–313.

Yangben, P. N & Seniwoliba A. J. (2014). Career challenges in construction craft training in technical vocational education and training in Ghana. *International Journal of Vocational and Technical Education, 6*(3), 13-29.

Zacher, H. (2015). Daily manifestations of career adaptability: Relationships with job and career outcomes. *Journal of Vocational Behavior*, *91*, 76–86. https://doi.org/10.1016/j.jvb.2015.09.003.