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The influence of career decision-making self-efficacy on employability of higher vocational students: mediated by emotional intelligence

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This study explored the relationship between career decision-making self-efficacy, employability, and emotional intelligence among senior vocational students in Guangdong, Hong Kong, and Macau Bay Area. A questionnaire was surveyed to 1,078 senior vocational students, the results showed that: career decision-making self-efficacy of senior vocational students had a significant positive effect on employability; emotional intelligence of senior vocational students had a significant positive effect on employability; career decision-making self-efficacy of senior vocational students had a significant positive effect on emotional intelligence; Emotional intelligence of senior vocational students mediates the relationship between career decision-making self-efficacy and employability.

KEYWORDS

career decision-making self-efficacy, employability, emotional intelligence, higher education, college student

1 Introduction

In recent years, the overall number of college graduates in China has been increasing day by day, and the employment situation of college students is complicated and severe, coupled with the current epidemic and the impact of the general environment, whether or not college students can be successfully employed after graduation has long become a key topic of concern for the whole society (Marinoni et al., 2020). The number of college graduates is increasing day by day. According to statistics, the scale of college graduates has reached a historical peak of 11.58 million in 2023 (Wang, 2022). However, in recent years, due to the impact of the Covid-19 epidemic and the pressure brought by the trade war between China and the United States, many companies have been operating poorly leading to layoffs and dissolutions, which have formed a double impact on the employment market, leading to increasingly fierce competition for employment, and the qualifications of Chinese higher education students are even more disadvantaged in terms of employment competitiveness (Guobing, 2020). As the Guangdong-Hong Kong-Macao Greater Bay Area is located in a prime location, talents play an important role (Zeng, 2018). In the context of the increasingly severe employment situation and the normalization of the new crown pneumonia epidemic, the employment of graduates from higher education institutions is a top priority (Zhou and Hua, 2023). The employment of college students has become a focal issue of common concern for the government, society and colleges and universities (Hu, 2019). The real reason for the employment dilemma of higher vocational students is precisely the lack of students' employability (Du, 2019).

Higher education institutions mainly cultivate advanced skills and application talents, and improving the employability of higher education students is the important part to alleviate the difficulty of college students' employment (Cassidy, 2006). In recent years, research on intrinsic factors and employability has been active, and as an important component of intrinsic factors, the level of emotional intelligence and self-efficacy directly or indirectly affects the employability of college students (Qiu, 2016; Wang et al., 2022). Therefore, it is very important and relevant to study the influence of intrinsic factors on employability of higher education students. Researchers have concluded that career decision-making self-efficacy has a significant impact on employability (Hu, 2019; Peng and Yue, 2022). Career decision-making self-efficacy is the decision maker's self-assessment or confidence in his or her ability necessary to complete various tasks during career decision making process. People with high emotional intelligence can quickly adapt to changes in life, learning and work, and take effective measures to deal with problems (Darvishmotevali et al., 2018). People with high career self-efficacy have a wider range of career choices, more positive job search behaviors, and are more likely to make career decisions and succeed in employment (Lent et al., 2017). Therefore, studying the career decision-making self-efficacy of higher education students has an important impact on improving their employability. In addition to career decision-making self-efficacy, emotional intelligence also plays an important role in improving the career quality and employability of contemporary college students. The cultivation of emotional intelligence can help improve college students' career literacy as well as help them achieve career success (Fall et al., 2013).

At present, scholars have studied career decision-making self-efficacy, emotional intelligence and employability more extensively and meticulously, but there is less research on the deep relationship between career decision-making self-efficacy, emotional intelligence and employability of college students (He, 2017). This study will explore the relationship between college students' career decision-making self-efficacy and employability, examine the mediating role of emotional intelligence between career decision-making self-efficacy and college students' employability, understand the influencing factors and mechanisms of college students' employability, and then provide value references for colleges and universities to enhance the educational guidance of college students' employment and improve college students' employment problems. Therefore, this study takes higher vocational students in the Guangdong-Hong Kong-Macao Greater Bay Area as the sample. Taking career decision-making self-reflection as the independent variable, emotional intelligence as the mediating variable, and employability as the dependent variable. Discuss the three aspects of employability, career decision-making self-responsibility and emotional intelligence and their mutual influence mechanism. It provides a new direction to improve the employment quality of higher vocational students and relieve students' employment pressure. And provide support for disabled talents to build an innovative country. The research questions of this study are as follows:

1. What is the impact of career decision-making self-efficacy on employability of higher education students?
2. What is the impact of career decision-making self-efficacy on emotional intelligence of higher education students?
3. What is the impact of higher education students' emotional intelligence on their employability?
4. Does emotional intelligence of higher education students play a mediating role in the effect of career decision self-efficacy on employability?

2 Literature review

2.1 Social cognitive theory

Social Cognitive Theory (SCT) is an educational theory developed by American psychologist Bandura (1999). The core of the theory is based on the triadic interaction determinism, which assumes that human behavior is influenced by a combination of personal and environmental factors. The ternary interaction model summarizes well the relationship between the influence of human self-factors, social environment factors and behavior, and attaches great importance to the influence of human self-factors and social environment factors on behavior, and from a psychological point of view, human energetic is influenced more by human subjective influence factors (Jin, 2020). Throughout Bandura's SCT system, it was found in the study that self-efficacy and emotional intelligence, as important components of personal variables, are of great research importance (Naghavi and Redzuan, 2012). Emotional intelligence is a new indicator and criterion for determining the attribution of human learning and career achievement, and has a great influence on human experience and behavior (Zhang and Wang, 2015). Self-efficacy is a core concept of SCT, which is a self-perception of people's ability to behave in a certain way, and when applied to specific research subjects in different domains, self-efficacy can better explain behavioral intentions (Maddux, 1995). For example, in the vocational domain, vocational self-efficacy, i.e., the belief in one's ability to perform career-related tasks and activities, is a determining factor in career decisions (Baglama and Uzunboylu, 2017). In summary, the key point of the social cognitive model is the measure of self-efficacy and emotional intelligence, which is directly related and relevant to the three variables in this study.

2.2 Employability and career decision-making self-efficacy

Employability is the competency that students can achieve their employment ideals, meet the needs of society, and realize their values in social life acquired through the learning of knowledge and the development of comprehensive quality during school (Zheng, 2002). It is the sum of the competitiveness that they have in the labor market in the present and the future, and it is an important indicator to stand out in the talent market (Finch et al., 2016). Enhancing students' employability, thus, can make students in higher vocational institutions more developmental and market potential in the severe employment environment (Jackson and Tomlinson, 2020). As a subjective factor that affects college students' employment psychological state, career decision-making self-efficacy is increasingly valued by academics as an important factor affecting college students' employability (Wang, 2020). Therefore, this study will explore the mechanism of the influence of college students' career decision-making self-efficacy on employability.

Ojonugwa found that self-efficacy beliefs can influence students' self-concept, confidence and competence, and acceptance of complexities and difficult tasks (Ojonugwa et al., 2015). They are important factors in improving employability (Gbadamosi et al., 2015). Introducing Bandura's theory of self-efficacy into the vocational and occupational field can increase the level of self-efficacy of college students, which in turn can increase the level of employability (Bandura, 1983; Shin and Oh, 2018). In previous studies, it has been shown that career decision-making self-efficacy has a positive correlation with college students' employability (Wang, 2016; Zheng and Wang, 2018). Students with high self-efficacy can stimulate intrinsic motivation and challenge to actively cope and try with high motivation, so that their potential can be developed (Liu X. W., 2022). Therefore, we propose the following hypothesis.

> *H*1: Career decision-making self-efficacy has a significant positive effect on employability.

2.3 Employability and emotional intelligence

General Secretary Xi Jinping pointed out that "socialist builders and successors should have both high moral character and true talent." High EQ and high IQ are the important criteria of "socialist builders and successors"(Wu, 2021). It is a common problem for higher vocational students to be "skilled but uneducated," but employers are paying more and more attention to vocational quality rather than professional quality. Therefore, higher education institutions must strengthen emotional intelligence education while focusing on students' vocational skills education (Liu, 2018). Emotional intelligence refers to a set of non-cognitive abilities, competencies and skills that affect an individual's ability to successfully cope with the environment and stress, including the ability to recognize one's own emotions, the ability to manage emotions properly, the ability to self-motivate, the ability to recognize the emotions of others and the ability to manage interpersonal relationships, which can be used to quickly adapt to different environments and self-motivate (Goleman, 1995; Puspitacandri et al., 2020). Numerous empirical studies have shown that emotional intelligence is an important factor influencing employability, and the two show a strong positive correlation (Liu, 2018; Salim and Safitri, 2020). The influence of emotional intelligence has penetrated into the whole process of employment and can greatly improve the employment competitiveness of individuals (Shi, 2016). Therefore, the following hypothesis is proposed:

> *H*2: Emotional intelligence of college students has a positive and significant effect on employability.

2.4 Emotional intelligence and career decision-making self-efficacy

According to research, self-efficacy also has a significant relationship with emotional intelligence (Schutte and Loi, 2014; Ngui and Lay, 2020). Students with higher emotional intelligence have a keen perception of emotional information about their environment and are able to generate positive impetus in performing tasks, which to some extent has a positive benefit on self-efficacy (Roberts et al., 2007). High career decision-making self-efficacy enhances an individual's emotion management and interpersonal skills. Individuals with high career decision-making self-efficacy are usually more confident to cope with different situations and challenges, and this confidence can have a positive impact on emotion management, which can improve emotional intelligence (Jiang, 2016). In addition, individuals with high career decision-making self-efficacy may be more willing to engage in social activities and collaborate with others, and this ability to engage in positive interactions can contribute to increased emotional intelligence (Garcia et al., 2015). Students with good career decision-making self-efficacy are able to assess their abilities and limitations more objectively, and through self-reflection they can better understand emotional needs and preferences, which contributes to emotional intelligence (Andonian, 2013). Therefore, the hypothesis is proposed:

> *H*3: Career decision-making self-efficacy making has a positive and significant effect on emotional intelligence.

2.5 The mediating role of emotional intelligence in the relationship between employability and career decision-making self-efficacy

To fully understand how informing students' career decision-making self-efficacy affects employability, we should also consider the mediating role between them. Some scholars indicated that there may also be mediating variables between career decision-making self-efficacy and college students' employability (Hu, 2019). Emotional qualities support a person's success and help college students step into society and connect with it (Mayer et al., 2004). The influence of emotional intelligence cannot be removed throughout a person's career and cannot be separated from its guiding, mediating, and regulating role (Urquijo et al., 2019). Emotional intelligence helps students maintain a good state of mind, assess their professional self objectively, make rational career decisions, and gain employment opportunities more easily. Therefore, the hypothesis is proposed that:

> *H*4: Emotional intelligence mediates the relationship between career decision-making self-efficacy and college students' employability.

3 Methods

3.1 Research structure

A research framework was constructed according to the aforementioned hypotheses (Figure 1).

3.2 Research tools

3.2.1 Career decision-making self-efficacy scale

The Occupational Efficacy (Self-Efficacy for Occupational Decision Making) Expectancy Scale, modified by Fu (2015), consists

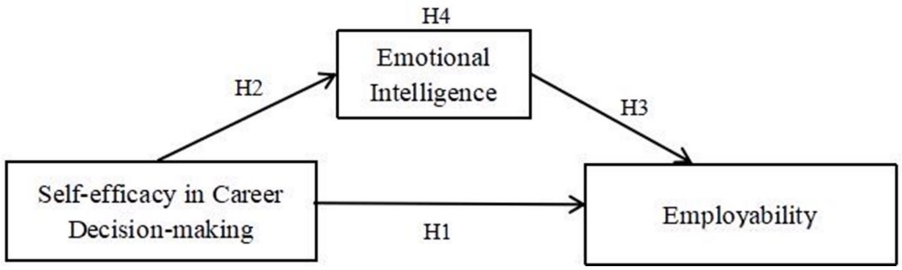

FIGURE 1
Research framework.

of 19 items and contains three constructs: self-assessment, planning and problem solving, and gathering work information. The scale was administered on a five-point Likert-type. Scores for each item were added to obtain the dimension score, and dimension scores were summed to obtain the total score. The internal consistency reliability of the scale was 0.912, and the internal consistency coefficients of the three dimensions reached 0.761, 0.818, and 0.827, respectively, which indicated that the scale had good reliability. Meanwhile, the validity test showed that the model fit was good, and the cumulative explanatory amount of the two factors was 50.74%, representing a good validity.

3.2.2 Employment ability scale

This study used the Employability Questionnaire for College Students developed by Yu, which contains eight dimensions of career identity, interpersonal relationship, optimism and cheerfulness, problem solving, social support, learning ability, teamwork, and network differences, with 36 questions in total, using a 5-point Likert scale (Yu, 2014). The employment score was the sum of scores of these eight subscales. The alpha coefficient of the full scale was 0.816, and the internal consistency coefficients of the eight dimensions reached 0.85, 0.84, 0.82, 0.83, 0.81, 0.79, 0.83, and 0.76, respectively, and the reliability of the questionnaire was good. The scale has been adopted by several empirical studies, and the scale data fit well, and the questionnaire has good structural validity.

3.2.3 Emotional intelligence scale

This study used the Emotional Intelligence Scale developed by American psychologist Schutte, which contains 33 questions divided into four major dimensions: emotional perception dimension, regulation of self-emotion dimension, regulation of others emotion dimension, and emotional use dimension (Schutte et al., 1998). The employment score was the sum of scores of these four subscales. The internal consistency reliability of the scale was 0.876, indicating that the scale has high reliability and good credibility, and later scholars widely used the scale to measure, and its measurement results performed well and proved to have high empirical validity.

3.2.4 Demographic variables

Two groups of confounders were considered in this study. The first group is basic demographic factors: gender, home location, major, grade and only child. The second group is other variables that may have an impact on risk employability, emotional intelligence or career decision-making self-efficacy, including student leader and off-campus internship.

3.3 Participants

China's Guangdong, Hong Kong, Macao and Greater Bay Area is a cluster of cities at the forefront of China's reform and development, and is an important testing ground for China's vocational education reform. There are many higher vocational institutions in the Guangdong-Hong Kong-Macao Greater Bay Area, which is a highland for the construction of talent cultivation in China's higher vocational institutions. This paper takes six higher vocational students in three places of Guangdong-Hong Kong-Macao Greater Bay Area as the research objects, and distributes 1,078 questionnaires by questionnaire star and field questionnaires with convenience sampling, and 1,008 valid questionnaires are recovered, with an effective rate of 93.51%. According to the formula provided by Israel (1992) for calculating sample size, the size of our study met the sampling criteria.

The studies involving human participants were reviewed and approved by Dhurakij Pundit University. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individuals for the publication of any potentially identifiable data included in this article.

This study used AMOS and SPSS to conduct descriptive statistics and Pearson correlation coefficient analysis on the variables of career decision-making self-efficacy, employability, and emotional intelligence to explore the specific relationships among the three pairs of variables and to examine the mediating role of emotional intelligence in the effect of career decision-making self-efficacy on employability.

4 Results

4.1 Analysis of differences in demographic variables for each variable of higher education students

4.1.1 Analysis of differences in demographic variables of emotional intelligence of higher education students

Independent samples t-test or ANOVA was used to analyze the variance in the scores of demographic variables of emotional

intelligence of higher vocational students. As shown in Table 1, there were significant differences ($p < 0.05$) between the variables of being a student leader, having an off-campus internship, and different home locations on the total and subscale scores of emotional intelligence of higher education students. Except for emotional use, there were significant differences in total emotional intelligence scores and the remaining three dimensions on the only child. There were no significant differences in all p-values greater than 0.05 for the total score of emotional intelligence and its dimensions scores on gender, major and family structure for senior students. Significant differences existed in the scores of students of different grades on the dimension of regulation of others' emotions, and no significant differences existed on the rest of the dimensions.

4.1.2 Analysis of differences in demographic variables of career decision-making self-efficacy of higher education students

Independent samples t-test or ANOVA was used to analyze the differences in the scores of demographic variables of career decision-making self-efficacy of senior vocational students. As shown in Table 2, there were significant differences ($p < 0.05$) in the total score and each dimension of career decision-making self-efficacy among senior students whether they were student leaders or not, whether they had off-campus internship experience or not, and different home locations. Except for the planning and problem solving dimensions, there were no significant differences between students of different genders on the other dimensions and total scores, while there were significant differences between students of different grades. There was no significant difference in the total score and subscale scores of career decision-making self-efficacy among students of different majors. Except for self-assessment, there were significant differences in the total scores and other dimensions of career decision-making self-efficacy of senior students on whether they were only children or not. There were significant differences between family structures in the scores of the dimension of gathering job information, and no significant differences in the rest of the dimensions and total scores.

4.1.3 Differences in demographic variables of higher education students' employability

Independent samples t-test or ANOVA was used to analyze the variance in the scores of demographic variables of employability of higher vocational students. As shown in Table 3, there were no significant differences in the total scores of employability and its other four dimensions in student cadres for higher vocational students, except for the four dimensions of career identity, interpersonal relationship, optimism and cheerfulness, and social support. There were significant differences between students with and without off-campus internship on the total score of employability and its dimensions. There were significant differences in interpersonal relationship, problem solving, social support, teamwork and total score of employability among students with different home locations. Significant differences were found in the occupational identity, interpersonal relationship, problem solving, social support, network difference dimensions and total scores of employability of senior students by gender, while no significant differences were found in the remaining three dimensions. There were no significant differences in students' total scores of employability and its dimensions in terms of majors. There were significant differences in the total scores of employability and its 8 dimensions except for career identity among higher vocational students for only children, and the scores of employability of only children were significantly higher than those of non-only children. Except for interpersonal relationships, there was no significant difference in the total score of employability and its dimensions among students with different family structures. There were no significant differences in the seven dimensions of employability among students of different grades except for teamwork, while there was a significant level of difference in the total score of competency.

4.2 Correlation analysis between variables

Pearson product-difference correlation was used to analyze the relationship between the variables. The correlation matrix of each variable is shown in Table 4, and there is a significant high positive correlation between employability, career decision-making self-efficacy and emotional intelligence.

4.3 Regression analysis

4.3.1 Model adaptation diagram

In this study, the theoretical model was constructed through a linear structural equation model, and the causal model was validated using AMOS software, and the results of the analysis were organized as shown in Figure 2.

4.3.2 The mediating role of emotional intelligence

In this study, structural equation modeling (SEM) was used to study the causal relationships between variables. As shown in Table 5, in Model 1, when the impact of career decision-making self-perception on employability is examined separately, career decision-making self has a significant positive predictive effect on employability ($\beta = 0.604$, $t = 12.288$), so hypothesis H1 is tested. In the second model, career decision-making self has a significant positive predictive effect on emotional intelligence ($\beta = 0.564$, $t = 19.891$). Therefore, hypothesis H3 is established. When the indicator emotional intelligence is introduced into model three, emotional intelligence has a significant positive predictive effect on employability ($\beta = 0.402$, $t = 7.065$), and the impact of career decision-making self-fulfillment on employability still exists ($\beta = 0.566$, $t = 12.288$), therefore hypothesis H2. When emotional intelligence is added to the prediction of career decision-making self-actualization on employability, the effect of independent career decision-making self-perception on the dependent variable employability is still significant. However, the predictive power decreased (β coefficient decreased from 0.604, $p < 0.001$ to 0.566, $p < 0.001$). Emotional intelligence plays a partial role in the impact of career decision-making self on college students' employability, which verifies hypothesis H4.

4.3.3 Intermediary effect test

In AMOS, a sample size of 2000 was set, and a "bias-corrected nonparametric percentile" Bootstrap method with 95% confidence intervals (CIs) was used. To analyze the mediating effect of emotional

TABLE 1 Analysis of differences in demographic variables of emotional intelligence of higher education students.

Projects	Student leader		Off-campus internship		Home location		Gender		Major		Only child		Family structure		Grade	
	T	P	T	P	T	P	T	P	T	P	T	P	F	P	F	P
Emotional perception	3.202	0.001	3.462	0.001	3.607	0.002	−1.107	0.269	−0.592	0.554	2.475	0.014	0.350	0.705	0.923	0.398
Self-regulation of emotions	2.542	0.011	2.461	0.014	2.516	0.012	−0.008	0.994	−0.427	0.669	2.091	0.037	0.522	0.593	2.061	0.128
Regulate the emotions of others	2.752	0.006	2.906	0.004	2.481	0.013	1.298	0.195	−1.790	0.074	2.142	0.033	0.141	0.868	5.160	0.006
Emotional use	3.992	0.000	3.911	0.000	2.209	0.027	0.772	0.440	−1.349	0.177	1.163	0.245	2.197	0.112	1.560	0.211
Total emotional intelligence score	3.391	0.001	3.460	0.001	2.851	0.004	0.287	0.774	−1.154	0.249	2.174	0.030	0.612	0.542	2.693	0.068

TABLE 2 Analysis of differences in demographic variables of career decision-making self-efficacy of higher education students.

Projects	Student leaders		Off-campus Internship		Home location		Gender		Major		Only child		Family structure		Grade	
	T	P	T	P	T	P	T	P	T	P	T	P	F	P	F	P
Self-assessment	2.471	0.014	2.347	0.019	2.270	0.023	0.741	0.459	−1.500	0.134	1.891	0.060	0.980	0.376	4.622	0.010
Planning and problem solving	2.392	0.017	2.894	0.004	2.795	0.005	2.429	0.015	−1.942	0.052	3.651	0.000	1.693	0.185	2.125	0.120
Gathering job information	2.665	0.008	3.387	0.001	2.902	0.004	1.903	0.057	−1.821	0.069	2.769	0.006	3.316	0.037	4.084	0.017
Total career decision-making self-efficacy score	2.633	0.009	3.057	0.002	2.780	0.006	1.779	0.076	−1.837	0.066	2.853	0.005	1.401	0.247	3.854	0.022

TABLE 3 Analysis of differences in demographic variables of employability of higher vocational students.

Projects	Student leader		Off-campus internship		Home location		Gender		Major		Only child		Family structure		Grade	
	T	P	T	P	T	P	T	P	T	P	T	P	F	P	F	P
Professional identity	2.121	0.033	3.192	0.001	1.879	0.061	2.091	0.037	−0.068	0.946	1.026	0.305	0.055	0.947	2.509	0.082
Interpersonal relationships	3.501	0.000	4.453	0.004	3.262	0.001	3.409	0.001	−1.372	0.052	3.254	0.001	6.548	0.001	0.784	0.457
Optimistic and cheerful	2.731	0.006	2.322	0.001	1.110	0.267	1.582	0.114	−1.188	0.236	2.265	0.024	0.756	0.470	2.515	0.081
Problem solving	0.747	0.455	3.217	0.002	3.014	0.003	4.700	0.000	0.622	0.534	3.115	0.002	1.192	0.304	2.687	0.069
Social support	−2.374	0.018	3.187	0.001	4.570	0.000	5.077	0.000	−0.219	0.826	4.297	0.000	0.243	0.784	0.334	0.716
Learning ability	1.684	0.093	2.470	0.014	1.741	0.082	0.912	0.362	−0.604	0.546	2.066	0.040	1.060	0.347	2.179	0.114
Teamwork	1.911	0.056	3.246	0.001	2.303	0.022	1.153	0.249	−1.010	0.313	2.290	0.022	0.228	0.796	8.547	0.000
Network differences	0.744	0.684	3.123	0.002	1.917	0.056	4.163	0.000	−1.014	0.311	3.289	0.001	1.679	0.187	2.361	0.095
Total Employability score	0.813	0.104	4.038	0.000	3.077	0.002	3.634	0.000	−0.765	0.444	3.101	0.002	1.079	0.340	3.319	0.037

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TABLE 4 Summary table of correlation analysis.

	Employability	Career decision-making self-efficacy	Emotional intelligence
Employability	1		
Career decision-making self-efficacy	0.802**	1	
Emotional intelligence	0.705**	0.714**	1

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$. Source: Compiled from this study.

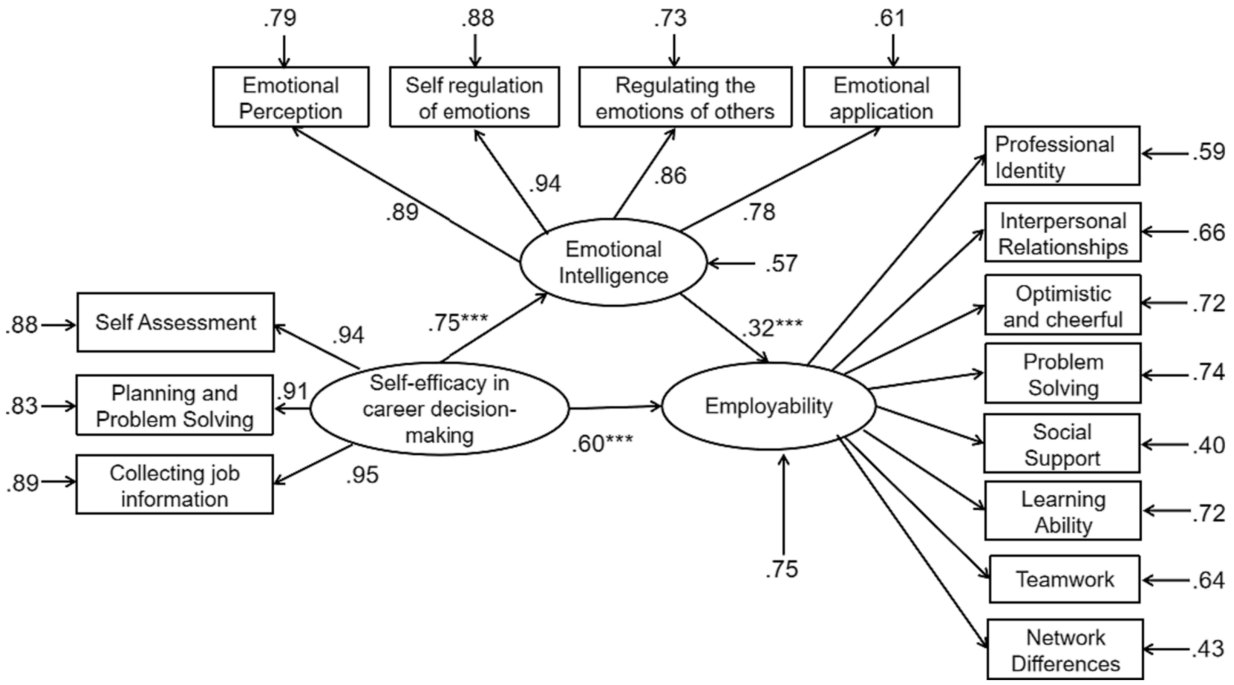

FIGURE 2
Causal model of career decision-making self-efficacy, emotional intelligence, and employability. Source: Compiled by the researcher.

TABLE 5 Variable related.

Variable	Dependent variable employability	Mediating variable emotional intelligence	Dependent variable employability
	Model 1	Model 2	Model 3
Independent variable career decision-making self-efficacy	0.604***	0.564***	0.566***
Mediating variable emotional intelligence	–	–	0.402***

Source: Compiled by the researcher.

intelligence in the influence of career decision-making self-efficacy on employability.

As shown in Table 5, the 95% confidence interval for the indirect effect bias correction ranged from 0.173 to 0.282, which did not contain 0 and reached a significant level, so there was a mediating effect; the 95% confidence interval for the direct effect bias correction ranged from 0.487 to 0.640, which did not contain 0, so it was a partial mediating effect; the 95% confidence interval for the total effect bias correction ranged from 0.731 to The 95% confidence interval of the total effect bias correction ranged from 0.731 to 0.852, which did not contain 0, and was again verified as a partial mediation effect (Table 6).

5 Conclusion and discussion

5.1 Analysis of differences in demographic variables among higher education students

5.1.1 Analysis of differences in demographic variables of emotional intelligence of higher education students

The total scores of emotional intelligence and its dimensions were significantly higher among higher education students who had been student leaders than those who had not been student leaders, which is consistent with the findings of Côté's study (Côté et al., 2010).

TABLE 6 Bootstrap intermediary effect checklist.

Path	Standardized path coefficient	95% CI for bias correction	
		Upper limit	Lower limit
Total effect	0.846	0.852	0.731
Direct effect	0.604	0.640	0.487
Indirect effects	0.242	0.282	0.173

Source: Compiled by the researcher.

Because good interpersonal relationships are a manifestation of competence, student cadres are generally more extroverted and can appreciate their own deficiencies in emotional intelligence in the context of practical activity experiences, which also enable student cadres to learn to get along with people and resolve conflicts with them when they undertake organizational and coordination work (Zhang, 2010). The total scores of emotional intelligence and its dimensions were significantly higher in higher education students with and without off-campus internship experience than in students without internship experience, indicating that good internship experience helps to improve students' emotional intelligence. Huang found that there was a significant positive correlation between the presence or absence of internship experience and the level of emotional intelligence (Cook et al., 2011). In the internship process, higher vocational students need to face a complex and changing environment, complete a wide range of messy tasks, and deal with interdepartmental relationships. All of them lead students to use emotional intelligence to solve the problems that arise in the actual work. Higher vocational students from urban areas scored significantly higher on all dimensions of emotional intelligence than those from rural areas, which is consistent with the findings of Yiyi et al. (2022). It may be due to the fact that the development of urban and rural areas in China is still unbalanced, and urban cities are more economically developed, have more convenient transportation and higher living standards compared to rural areas, and urban students are in a prosperous living environment with more open horizons and better exercise opportunities, so their emotional intelligence levels are slightly higher than those of students from rural areas (Xue, 2021). Only children scored higher than non-only children on all dimensions of emotional intelligence and showed significant good performance except for the emotional use dimension, which is consistent with the results of Zhao et al. (2022). This is due to the fact that only children receive more attention and pampering during their growth, are nurtured and developed in all aspects, and are brave in expressing and communicating, so their emotional intelligence is slightly better than that of non-only children. There were no significant differences in the total emotional intelligence scores of higher education students and its dimensions in terms of gender, major, family structure and grade level, which is consistent with researchers (Zhang, 2010).

5.1.2 Analysis of differences in demographic variables of career decision-making self-efficacy of senior vocational students

Student leaders' scores on all dimensions of career decision-making self-efficacy were significantly higher than those of ordinary students, in line with the scholarly Pan's study found consistent (Pan, 2022). It can be seen that the work of student cadres has enabled senior students to get a comprehensive exercise in their daily work and have a clearer self-concept of their work ability and career traits (Gu, 2022). Higher vocational students with off-campus internship experience also have higher career decision-making self-efficacy than those without internship experience, which is consistent with the view of scholar Liu Z. (2022). This is because in the fierce market competition, actual work experience can largely enhance students' practical ability and complete the real transition from theory to practice. Higher vocational students with internship experience are better able to recognize the employment situation, have a clearer career plan, and therefore have higher career decision-making self-efficacy (Wang, 2021). In terms of home location, the scores of career decision-making self-efficacy of higher vocational students from urban areas were significantly higher than those from rural areas, which is consistent with Guo's study (Guo, 2016). Urban higher vocational students are in an economically developed and materially rich living environment, and they have greater advantages in terms of comprehensive quality and social resources, and their self-efficacy is relatively higher (Chen et al., 2021). In terms of gender and major, there is no good significance of career decision-making self-efficacy in general, so neither gender nor major is an intrinsic factor affecting career decision-making self-efficacy, which is still consistent with the findings of scholar Wei (2017). The scores of all dimensions of career decision-making self-efficacy of only children are significantly higher than those of non-only children, which is consistent with the findings of Xing (2019). This is because only children are more concerned and nurtured by their parents from childhood and strive to develop their potential, which has an enthusiastic impact on students' career unfolding (Tang et al., 2021). As for the grade level, there was a significant difference in students' total career decision-making self-efficacy score and its 2 dimensions, and the overall score increased with grade level, indicating that students in higher grades tend to show higher career decision-making self-efficacy.

5.1.3 Analysis of differences in demographic variables of career decision-making self-efficacy of senior vocational students

There was no significant difference in employability between student leaders and general students, but in specific dimensions, student leaders were significantly higher than general students in career identity, interpersonal relationship, optimism and social support dimensions. The reason for the difference may be that student cadres' experience allows students to be trained in general quality and comprehensive ability, and they also have good interpersonal relationships with school teachers and other people, so they get stronger social support and show significant advantages in career identity. On the off-campus internship, the employability of higher vocational students showed significant levels, which is consistent with the study of Liu (2020). Internship is an important way to enhance the employability of higher vocational students, paving the way for later career development and making themselves clearer about their future development (Thi Ngoc Ha and Dakich, 2022). For the aspect of home location, urban students have significantly higher employability overall than rural students, which is consistent with the results obtained from Liu's study (Liu, 2020). This is due to the fact that urban areas are richer in resources, students have a broader cognitive horizon, more social connections available, and access to better social support, which promotes better employability (Abd Majid et al., 2020). In terms of gender, male students have slightly higher total employability scores than female students and have significant

advantages in career identity, interpersonal relationships, problem solving, social support, and network differences, indicating that gender differences still exist in China in the current society in the career field. There was no significant difference in students' total score of employability and its dimensions in their majors, indicating that there was no significant effect of professional differences on employability and its dimensions among higher vocational students, which is consistent with the study of Zhang (2020). There were significant differences in the total scores of employability and its 8 dimensions except for career identity among senior vocational students with respect to only children, and the scores of employability of only children were significantly higher than those of non-only children. This indicates that only children can be nurtured by their parents more intently than non-only children, which allows them to develop and improve all aspects of their potential and thus enhance their employability (Meng, 2019). Lv concluded that family structure does not have a significant effect on the development of employability of higher education students, which is consistent with the results of this paper (Lv, 2012). There is a significant difference in the teamwork dimension of students' employability in terms of grade level, and no significant difference in the remaining eight dimensions, while there is a significant level of difference in the total score of competency, with fluctuating changes in the overall score.

5.2 The relationship between career decision-making self-efficacy, emotional intelligence and employability of higher vocational students

5.2.1 Career decision-making self-efficacy has a significant positive effect on employability

The results of this study showed that career decision-making self-efficacy of higher education students had a significant positive effect on employability. This is consistent with the findings of studies by Wang et al. (2016), Hu (2019). The researchers concluded that when college students have better career decision-making self-efficacy ability, their employability will be better, with a significant positive correlation. As a core variable in the job search process, career decision-making self-efficacy of college students can influence job search intention, effort level, etc., and has an important guiding role in career selection (Lee et al., 2022). Students with a stronger sense of career decision-making self-efficacy will actively engage in career planning and enhance their career decision-making self-efficacy, which can improve the employment difficulties of college students and enhance their confidence in career decision-making activities, thus improving their own employability.

5.2.2 Emotional intelligence has a significant positive effect on employability

The results of this study showed that emotional intelligence of higher education students had a significant positive effect on employability. She found that there is a positive relationship between emotional intelligence and employability (She and Hu, 2021). People with high emotional intelligence have better emotional control and interpersonal relationships, which are conducive to promoting the growth and success of college students and better serving society. It is essential to cultivate good emotional intelligence for a person's career success. With a positive mindset, it is easy to stimulate creativity and potential (Jafri et al., 2016). Higher vocational students with high emotional intelligence have clear career plans, can make full use of multiple channels to obtain employment information, seize opportunities in the job search process and work hard for them. At the same time, they also have a certain level of stress tolerance, and can be optimistic in the face of setbacks, quickly adjust their emotions, reflect on the reasons for failure and improve in time (Sekreter, 2019).

5.2.3 Career decision-making self-efficacy has a significant positive effect on emotional intelligence

This study explored the relationship between career decision-making self-efficacy and emotional intelligence of higher education students. The results showed that career decision-making self-efficacy of higher education students had a significant positive effect on emotional intelligence. This is in line with the findings of Hamzah and Angeli studies (Santos et al., 2018; Hamzah et al., 2021). Cultivating career decision-making self-efficacy in higher education students can enhance students' self-knowledge, improve their action skills, and enhance their adaptability, and students with high career decision-making self-efficacy can effectively control their emotions, express themselves clearly and fluently, and establish harmonious interpersonal relationships.

5.2.4 Emotional intelligence mediates the relationship between career decision-making self-efficacy and employability

This study shows that career decision-making self-efficacy can not only act directly on employability, but also indirectly through the mediating role of emotional intelligence. Students with high career decision-making self-efficacy usually have high emotional intelligence and good emotional quality, and this emotional intelligence can play a part in mediating the effect on employability. That is, career decision-making self-efficacy can have a positive effect on employability through good emotional intelligence.

6 Recommendation

6.1 Recommendations for higher education institutions

6.1.1 Improving senior students' career decision-making self-efficacy

Higher education institutions should cultivate the career decision-making self-efficacy of higher education students, and in education and training, they can offer more elective courses in various industry-related professions to find out where the interests of job-seeking lie, and at the same time improve students' job-seeking skills in all aspects. Teachers should also often send positive and encouraging messages to students to improve their job search information and employment motivation, so as to enhance their career decision-making self-efficacy and reduce employment pressure.

6.1.2 Paying attention to the cultivation of emotional intelligence of higher vocational students

Colleges and universities should offer courses on emotional intelligence education to help students systematically understand the connotation of emotional intelligence and the path to enhance it, to effectively enhance the confidence level, self-awareness and interpersonal communication and

other emotional qualities of higher vocational students, to help students know themselves so as to make career plans and form good behavioral habits, and to provide powerful guidance for the overall development of moral, intellectual, physical, social and esthetic development and the enhancement of employability of higher vocational students.

6.1.3 Emphasis on the development of professional skills and literacy

Higher vocational institutions should pay attention to the core literacy of vocational skills of higher vocational students, design scientific and reasonable curriculum teaching, guide students to establish a healthy and correct employment concept, make students have a clear understanding of their professional knowledge, career concept and social needs, make solid efforts to learn professional knowledge, focus on the cultivation and accumulation of employability and enhance career awareness.

6.2 Suggestions for higher education students

6.2.1 Increase investment in learning and enhance professional skills

"Opportunity is reserved for those who are prepared," higher vocational students should keep the drive to learn and not stop the pursuit and desire for knowledge. With real knowledge, they can adapt to many kinds of positions in the future and be well prepared for future career selection. The layoffs carried out by most enterprises have led to the inflow of some highly skilled employees into the talent market, which is undoubtedly a source of employment pressure for graduates, so any graduate should pay attention to the acquisition of knowledge and truly "live to learn."

6.2.2 Enhance emotional management skills

Knowing how to control your emotions is what makes you a person with high emotional intelligence, and controlling your emotions requires strong mental qualities. Students should have a correct understanding of their own value, actively develop their own potential, give full play to their subjective initiative, pay attention to their own emotional fluctuations, be the master of their emotions, not be swayed by their emotions, constantly enrich their spiritual world, and then enhance their anti-stress ability, improve students' career decision-making self-efficacy, enhance their confidence in making career decisions, and promote self-development.

7 Limitations and suggestions for future research

There are some limitations to this study. First, the research design was cross-sectional. Although the mechanism of risk perception on anxiety can be inferred by analyzing the mediating effect of self-efficacy, the mediating relationship is not equal to the causal relationship. In addition, there may be reverse causality between variables; therefore, a longitudinal study is necessary to determine the causal relationship between variables. Secondly, the questionnaire method was used in this study, and future studies should incorporate the use of research methods such as qualitative or quasi-experimental design in order to obtain more comprehensive and accurate findings.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical approval was not required for the studies involving humans because The countries and institutions under which the institute operates do not require an ethical review. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

DZ: Writing – original draft, Writing – review & editing, Data curation, Funding acquisition, Investigation, Project administration, Software, Validation. ZP: Funding acquisition, Writing – original draft, Conceptualization, Resources. HZ: Investigation, Software, Writing – original – draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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