



AI literacy and employment anxiety: The mediating role of career adaptability

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Abstract: This study investigates the psychological mechanisms through which AI literacy is associated with reduced employment anxiety in university students. Drawing on the Conservation of Resources Theory and the Career Construction Theory, we tested a model where career adaptability mediates the relationship between AI literacy and employment anxiety. Data were collected from 424 Chinese university students (mean age = 22.2 years; 73.82% female; 58.96% undergraduates; and 44.95% studying humanities and social sciences) through a two-wave survey. The results showed that AI literacy was negatively associated with employment anxiety. Furthermore, career adaptability significantly mediated this relationship. The findings highlight the role of AI literacy as a crucial psychological resource and suggest the need for higher education to integrate AI literacy to help reduce university students' employment anxiety in the AI era.

Keywords: AI literacy; employment anxiety; career adaptability; university students

Introduction

The modern global economy, characterized by volatility and rapid technological advancements, has profoundly disrupted the labor market. Meanwhile, the socioeconomic aftershocks of events like the COVID-19 health crisis continue to affect employment prospects for new entrants, creating a prolonged period of uncertainty (ILO, 2026; Liang et al., 2022). For university students, such an environment can easily raise concerns about future career prospects, causing feelings of anxiety (Tomlinson et al., 2023; Zheng et al., 2022). Employment anxiety, defined as a negative emotion experienced by individuals when prospectively considering or actively searching for a job (Linge & Kosnin, 2024), can threaten students' mental health (Jones et al., 2016), life satisfaction (Shin, 2019), and job readiness (Kim et al., 2022). Therefore, exploring the factors associated with employment anxiety and finding effective coping strategies has become a key focus for both research and practice.

Existing research has explored factors affecting employment anxiety, such as social support (Zhang et al., 2023) and economic constraints (Wan et al., 2024). However, these traditional frameworks largely ignore the unique challenges and opportunities brought about by the ongoing digital and AI-driven transformation. Artificial Intelligence (AI), at the forefront of the recent technological revolution, is drastically altering the global economy and job market (Frank et al., 2019). While AI technologies automate repetitive and procedural tasks, they also generate demand for new skills, imposing new requirements on future work models, career paths, and core job competencies (Cramarenco et al., 2023; OECD, 2023). In this regard, AI literacy, a complex concept that includes the knowledge, skills, and attitudes required to understand, use, evaluate, and ethically consider AI technologies (Ng et al., 2021), is becoming an essential competency for individuals to adapt to the age of AI (Wut et al., 2025).

The primary goal of this study is to position AI literacy as a key factor that may be associated with employment anxiety, exploring its potential to reduce this widespread concern among university students.

Furthermore, understanding how individuals convert human capital resources like AI literacy into psychological resources for coping with environmental pressures is vital for clarifying the adaptation process. Career Construction Theory (CCT) provides a robust theoretical perspective for this investigation. CCT highlights individuals' agency in actively shaping their careers within a constantly changing labor market (Savickas, 2005, 2012). Its core concept, career adaptability, refers to the psychosocial resources a person uses to handle current and upcoming career challenges, transitions, and traumas (Savickas, 2005). Given the essential role of career adaptability in managing career uncertainty (Maggiori et al., 2013), we identify it as a key mediating variable, which can help uncover the psychological pathway through which AI literacy may influence university students' employment anxiety.

AI literacy and employment anxiety

As AI technology becomes more integrated into all industries, AI literacy is increasingly emerging as a key personal resource. The Conservation of Resources (COR) theory posits that stress occurs when resources are threatened with loss or when individuals fail to gain resources after substantive resource investment (Hobfoll, 1989). This puts resource loss at the center of the stress experience. The resource gain spiral in COR theory suggests that acquiring more resources improves one's capacity to withstand future resource loss and facilitates the gaining of new resources (Hobfoll et al., 2018). Therefore, students with higher AI literacy, due to their broader resource reservoir than those with only traditional skills, may perceive fewer threats or be more equipped to address challenges in this volatile



job market, which helps lower their employment anxiety (Li et al., 2025).

The mediating role of career adaptability

While COR theory explains the positive function of resources in reducing stress, CCT offers a more detailed explanation of how individuals turn these resources into adaptive behaviors and positive outcomes. CCT outlines an adaptation process that starts with adaptive readiness, then leads to the development of adaptability resources, which in turn guide adapting responses and adaptation results (Savickas, 2012). The dramatic changes brought by AI suggest that AI literacy may act as a catalyst in the CCT adaptation sequence, specifically by fostering adaptability resources.

Career adaptability represents the core of adaptability resources in CCT, comprising four interconnected resources: concern, control, curiosity, and confidence (the 4Cs) (Savickas, 2012). The development of AI literacy can systematically foster all four types of resources. First, enhancing AI literacy prompts students to get a better grasp of AI trends, industrial applications, and their impact on various sectors. This knowledge encourages them to look beyond immediate academic tasks and prospectively plan their future career paths, thereby strengthening their career concern and planning awareness (Lee et al., 2021). Second, regarding career control, individuals with AI literacy can transform AI from an external, potentially uncontrollable threat into an internal, learnable, and usable tool (Low et al., 2025). This cognitive shift from passive acceptance to active mastery may enhance their sense of control over their future job search. Third, AI literacy could open doors to emerging career fields, which may spark students' curiosity to explore the content and skill requirements of AI-related jobs and further motivate them to engage with related online courses, projects, or internships, thus broadening their vocational horizons (Rini & Suryadinata, 2022). Finally, the experience of successfully learning and applying AI knowledge and skills is a source of self-efficacy (El-Sayed et al., 2025), which can enhance students' confidence in their own abilities, making them feel more prepared for future job challenges (Li et al., 2025).

Furthermore, extensive research indicates that people with high career adaptability possess greater psychological resources to cope with work-related stress, thereby reducing anxiety (Boo et al., 2021). Within the CCT framework, career adaptability (adaptability resources) facilitates effective adapting responses, like proactive job searching, which may lead to better adaptation outcomes, including reduced employment anxiety. Specifically, students with high career concern would plan their future proactively, thereby reducing uncertainty (Chen & Zeng, 2021). Those with high career control may attribute challenges to controllable factors, which could mitigate helplessness (Daniels et al., 2011). Besides, high career curiosity could foster a growth mindset, turning challenges into learning opportunities (Harvey et al., 2009). Finally, high career confidence could fuel proactive efforts and resilience against setbacks (Wan et al., 2024). Together,

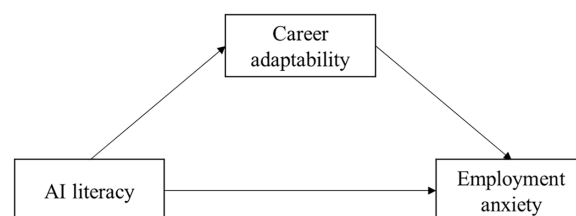


Figure 1. The path model

these four dimensions form a psychological buffer system that may effectively mitigate the negative emotional impact of labor market uncertainty, being associated with significantly lower anxiety levels.

Goal of the study

The purpose of this study was to examine the relationship between AI literacy and employment anxiety, as well as the mediating effect of career adaptability. Based on the theoretical analysis above, we formulated the following hypotheses:

Hypothesis 1: *AI literacy is negatively associated with employment anxiety.*

Hypothesis 2: *AI literacy is positively associated with career adaptability.*

Hypothesis 3: *Career adaptability is negatively associated with employment anxiety.*

Hypothesis 4: *Career adaptability mediates the relationship between AI literacy and employment anxiety.*

The path model is presented in Figure 1.

Method

Participants and procedure

Using a cluster sampling method, this study recruited participants from a university in Guizhou, China. We randomly selected 8 classes (5 undergraduate and 3 master's level) for participation. To address concerns regarding common method variance, data for this study were gathered at two distinct time points, separated by an interval of two weeks. At Time 1, we measured AI literacy and demographic variables; at Time 2, we measured career adaptability and employment anxiety. Questionnaires were administered under the guidance of class instructors. From an initial pool of 492 students, we obtained 467 matched survey pairs. Following the exclusion of questionnaires with incomplete or invalid data, the final analysis was based on a sample of 424 valid responses, representing an effective response rate of 86.2%. The average age of the participants was 22.2 years, 73.82% were female, 58.96% were undergraduate students, and 44.95% were majoring in humanities and social sciences. All procedures were approved and supervised by the Academic Ethics Committee of the School of Public Administration, Guizhou University (Approval Number: 202501). Prior to the survey, all participants provided consent to participate voluntarily after learning about the study's aims and confidentiality guidelines.

Measures

AI literacy

AI literacy was measured with a 15-item scale developed for Chinese college students by Ma & Chen (2024). The scale consists of four dimensions: awareness (4 items, e.g., “I understand the definition of artificial intelligence”), usage (3 items, e.g., “I am proficient in using artificial intelligence applications or products”), evaluation (4 items, e.g., “I can identify biases in content generated by artificial intelligence”), and ethics (4 items, e.g., “I am always alert to the misuse of artificial intelligence technology”). Responses were recorded on a 7-point Likert-type scale (1 = strongly disagree to 7 = strongly agree) and a mean score was calculated. In the present study, the Cronbach's α for the AI literacy scale was 0.90.

Employment anxiety

A 6-item employment anxiety scale was developed based on the Graduate's Vocational Selection Anxiety Scale (Zhang & Chen, 2006), using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Sample items include “The thought of employment fills me with anxiety” and “I have no confidence in finding a good job in the future”. A mean score was calculated, with higher scores indicating higher employment anxiety. The Cronbach's α for the employment anxiety scale was 0.87.

Career adaptability

We used a 12-item Chinese Career Adapt-Abilities Scale-Short Form developed by Yu et al. (2020) to measure career adaptability. It contains four dimensions: concern (3 items, e.g., “Thinking about what my future will be like”), control (3 items, e.g., “Making decisions by myself”), curiosity (3 items, e.g., “Looking for opportunities to grow as a person”), and confidence (3 items, e.g., “Taking care to do things well”). Participants rated each item using a 5-point Likert-type scale (1 = not strong to 5 = strongest) and a mean score was calculated. The Cronbach's α for the career adaptability scale was 0.91 in the current study.

Data analysis

A multi-step process was used to analyze the data using STATA version 17. First, we conducted a confirmatory factor analysis (CFA) to test the validity of the measurement model. Second, we used Harman's single-factor test and CFA to assess the degree of common method

variance (CMV). Then, we calculated the mean, standard deviation, and Pearson correlations for each focal variable. Lastly, regression analysis and a bootstrapping process for mediation analysis were used to investigate the proposed hypotheses.

Confirmatory factor analysis

As shown in Table 1, the proposed three-factor measurement model demonstrated an acceptable fit to the data ($\chi^2/df = 2.65$, CFI = 0.942, TLI = 0.922, RMSEA = 0.072, SRMR = 0.058). This fit was significantly better than alternative one-factor or two-factor models, supporting the discriminant validity of our measures. We also established convergent validity, with Average Variance Extracted (AVE) values for all three variables exceeding 0.5, and composite reliability (CR) values exceeding 0.7.

Common method variance

Although a time-lagged research design was used in this study, all variables were self-reported, therefore, we used Harman's single-factor test to investigate the potential impact of common method variance. The test findings showed that the first component accounted for 36.4% of the overall variation. This figure falls well below the recommended criterion of 50%. Additionally, as depicted in Table 1, the fit indices for the one-factor model and two-factor models were unacceptable, suggesting that CMV is not a serious issue in this study.

Results

Descriptive analysis

A summary of the descriptive statistics and bivariate correlations for the focal variables is provided in Table 2. Consistent with our expectations, the correlation matrix indicated that AI literacy, employment anxiety, and career adaptability were all significantly intercorrelated.

Regression analysis

As shown in Model 1 in Table 3, AI literacy had a significant negative predictive effect on employment anxiety ($\beta = -0.31$, $p < 0.001$). Therefore, Hypothesis 1 was supported.

The mediating effect analysis

As shown in Model 2 of Table 3, AI literacy was found to be a significant positive predictor of students' career

Table 1. Results of confirmatory factor analysis

Models	χ^2	df	χ^2/df	CFI	TLI	RMSEA	SRMR
Three-factor model	108.81	41	2.65	0.942	0.922	0.072	0.058
Two-factor model 1	426.87	43	9.93	0.810	0.757	0.163	0.110
Two-factor model 2	906.78	43	21.09	0.621	0.515	0.230	0.172
Two-factor model 3	553.89	43	12.88	0.760	0.693	0.183	0.154
One-factor model	1067.44	44	24.26	0.558	0.448	0.246	0.157

Note. Three-factor model: AI literacy, Employment anxiety, Career adaptability; Two-factor model 1: AI literacy + Employment anxiety, Career adaptability; Two-factor model 2: AI literacy, Employment anxiety + Career adaptability; Two-factor model 3: AI literacy + Career adaptability, Employment anxiety; One-factor model: AI literacy + Employment anxiety + Career adaptability.

Table 2. Descriptive statistics and correlation coefficients (N = 424)

Variables	M	SD	1	2	3
1. AI literacy	4.7	0.83	1		
2. Employment anxiety	3.5	0.82	−0.34***	1	
3. Career adaptability	4.1	0.51	0.44***	−0.35***	1

Note. *** $p < 0.001$.

Table 3. Results of regression analysis (N = 424)

	Model 1		Model 2		Model 3	
	Employment anxiety		Career adaptability		Employment anxiety	
	β	t	β	t	β	t
Gender	0.15**	3.28	−0.19***	−4.35	0.11*	2.43
Age	−0.10*	−1.99	0.09	1.89	−0.08	−1.66
Education	−0.10	−1.76	−0.02	−0.46	−0.10	−1.90
AI literacy	−0.31***	−6.44	0.42***	10.19	−0.23***	−4.50
Career adaptability					−0.21***	−4.39
R^2	0.17		0.25		0.20	
Adjust R^2	0.16		0.24		0.19	

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; β represents standardized coefficients.

adaptability ($\beta = 0.42$, $p < 0.001$), supporting Hypothesis 2. Model 3 revealed that career adaptability significantly and negatively predicted employment anxiety ($\beta = -0.21$, $p < 0.001$), supporting Hypothesis 3.

We further utilized a bootstrapping procedure (5000 resamples) in STATA to test the mediating role of career adaptability in the relationship between AI literacy and employment anxiety. As shown in Table 4, the indirect effect was -0.09 , with a bias-corrected Bootstrap 95% confidence interval of $[-0.13, -0.05]$. Since this interval excludes zero, the mediating effect is statistically significant. The mediating effect accounted for 28% of the total effect. Therefore, Hypothesis 4 was supported.

Discussion

This study found that AI literacy is negatively associated with employment anxiety. This finding aligns with the Conservation of Resources (COR) theory, which posits that the accumulation of valuable resources can buffer against stress (Hobfoll, 1989; Hobfoll et al., 2018). In the contemporary labor market, where AI-driven transformations create uncertainty, AI literacy represents a critical personal resource. Our results suggest that students who possess it are better equipped to navigate an environment

increasingly shaped by AI, perceiving fewer threats and more opportunities. Whereas previous research suggested that possessing skills relevant to future job demands can mitigate career-related stress (Rizkina et al., 2025), our study specifically identifies AI literacy as a key resource in the current AI-driven era.

Furthermore, consistent with recent experimental research (Anwar et al., 2025), this study demonstrated a positive association between AI literacy and career adaptability. This enriches Career Construction Theory (CCT) by identifying a novel, technology-oriented antecedent of career adaptability resources. While prior research has largely focused on antecedents like personality traits, social support, educational experiences (Johnston, 2018) or specific training (Green et al., 2020; Koen et al., 2012), our study demonstrates that the proactive acquisition of a technical literacy that aligns with market demands is associated with the systematic development of the 4Cs. This implies that AI literacy is not merely a passive skill set but an active developmental experience that fosters the psychosocial resources needed for career adaptation.

Finally, this study found that career adaptability is negatively associated with employment anxiety and, crucially, that it mediates the relationship between AI literacy and

Table 4. Results of mediating effect analysis (N = 424)

	Effect value	Proportion	Bootstrap 95%LLCI	Bootstrap 95%ULCI
Direct effect	−0.22	72.0%	−0.32	−0.12
Indirect effect	−0.09	28.0%	−0.13	−0.05
Total effect	−0.31	100%	−0.40	−0.21

Note. Based on 5000 bootstrap resamples. LLCI = Lower Limit Confidence Interval; ULCI = Upper Limit Confidence Interval.

employment anxiety. This finding illuminates the psychological process via which technical literacy may influence psychological well-being. It suggests that the benefits of AI literacy are not merely instrumental, improving employability (Portocarrero Ramos et al., 2025) or future job quality (OECD, 2023), but are also converted into a set of psychosocial resources that help students cope with uncertainty. This aligns with and builds upon existing literature showing that career adaptability is a potent buffer against career-related distress (Boo et al., 2021; Shin & Lee, 2019). Our research adds a critical layer to this understanding by demonstrating a concrete pathway—developing AI literacy—to cultivate this adaptability. While previous research has focused on distinguishing different resources (Luthans et al., 2004), this mediation pathway provides an insight into resource transformation, showing how AI literacy as a human capital resource could be transformed into a psychological resource (career adaptability), empowering students to frame job-seeking challenges as manageable and less threatening.

Implications for practice

The findings of this study offer several important implications for practice. Universities and career counselors should recognize AI literacy not just as a technical skill but as a vital component of career readiness and mental health support. Higher education curricula should integrate AI literacy across disciplines, not just in STEM fields, to ensure all students are prepared for the future of work (Mei et al., 2023). Career services can develop workshops that not only teach AI-related job-seeking tools but also explicitly link the development of these skills to building the psychological resources of career adaptability, such as confidence and control. Encouraging students to proactively engage with AI can empower them to transform a source of anxiety into a resource for career construction.

Limitations and future research

This study has several limitations that offer promising avenues for future research. First, our cross-sectional design does not permit strong causal inferences. Future research should employ longitudinal designs or experimental methods to control for other confounding factors, such as personal learning ability, and establish causality more firmly. Second, the sample was recruited from a single university in China with a gender imbalance, which may constrain the external validity of our results. To test the robustness and enhance the generalizability of our model, subsequent research should endeavor to replicate our study using more heterogeneous samples drawn from diverse contexts. Finally, the mediating effect of career adaptability, while significant, was relatively small (accounting for 28% of the total effect), which suggests that other mechanisms may also be at play. Future studies could explore other potential mediators, such as career-related self-efficacy or identity, which might provide a more comprehensive explanation for how AI literacy relates to employment anxiety.

Conclusion

This study provides a theoretical and empirical basis for understanding the relationship between AI literacy and employment anxiety and the mediating role of career adaptability. Specifically, AI literacy is negatively associated with employment anxiety, while career adaptability is positively associated with AI literacy and negatively associated with employment anxiety, partially mediating the relationship between AI literacy and employment anxiety. This study offers implications for leveraging AI literacy as a key factor to help reduce university students' employment anxiety through enhancing their career adaptability.

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Availability of Data and Materials: The data that support the findings of this study are available from the corresponding author, Xixi Chu, upon reasonable request.

Ethics Approval: All procedures were approved and supervised by Academic Ethics Committee of the School of Public Administration, Guizhou University (Approval Number: 202501). Prior to the survey, all participants provided consent to participate voluntarily after learning about the study's aims and confidentiality guidelines.

Conflicts of Interest: The authors declare no conflicts of interest.

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