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A study on the impact of mentoring on the employment of postgraduate students in Chinese colleges

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Postgraduate student mentoring and postgraduate employment are two pressing challenges in postgraduate education today, and we focus on the relationship between the two in an effort to address both issues. Based on a survey of 725 Chinese postgraduate students, this study explored the relationship between the mentoring and postgraduate employment. Specifically, this study delves into how mentoring influences postgraduate employment satisfaction by enhancing employability, which includes academic competence, personal quality competence, and employment capital. The results show that (1) the mentoring is significantly and positively correlated with the employment satisfaction of postgraduate students, exerting a notable direct effect on their employment satisfaction; (2) academic competence, personal quality competence, and employment capital have a significant mediating effect between the mentoring and employment satisfaction of postgraduate students. In summary, this research highlights the critical role of mentoring in bolstering postgraduate employment satisfaction by fostering the cultivation of employability skills.

KEYWORDS

postgraduate students, mentoring, employment satisfaction, employability, mediation role

Introduction

Postgraduate education is an important channel for the country to accelerate the implementation of the innovation-driven development strategy and cultivate high-level, top-class innovative talents. Also is a crucial foundation for social transformation and innovation (Kuzhabekova, 2021). The need for postgraduate education is gradually being recognized by governments and are vigorously promoting and financing its development in order to cultivate high-quality talents who are competitive in the global economy (McAlpine et al., 2020; Tang et al., 2020; Hu and Zhu, 2023). In addition, the desire for students to move beyond baccalaureate status is expanding due to status attainment and the variables associated with it, all of which contribute to the continued growth of postgraduate students (Amida et al., 2020). According to the Council of Graduate Schools (CGS), the average growth rate of postgraduate students over the 10-year period from the 2009–10 academic year to the 2019–20 academic year is 9.5% (Hu and Zhu, 2023).

With a view to producing a large number of high-quality postgraduate students, this will be conducive to providing a steady stream of high-level talents to support the high-quality development of the economy. Based on the demands of the development of the times, the scale of China's postgraduate students has been expanding year by year, becoming one of the largest postgraduate education systems in the world. The number of enrolled postgraduate students in China has gradually increased from only 629–3.65 million between 1949 and 2022. Not only that, but the scale of China's postgraduate

education is still expanding, and its share of higher education enrolments is steadily increasing. The rapid expansion of postgraduate enrolments can, to a certain extent, effectively promote economic growth. At the same time, the continuing expansion of postgraduate education and the structural distortions of the labor market have led to a great deal of attention being paid to the employment of postgraduate students. Factors such as the declining degree values, underemployment, mismatches between skills and labor market needs, and the threat of a global recession are all current issues in a number of countries, and these factors make postgraduate employment a critical issue that needs to be addressed in postgraduate education (McAlpine et al., 2020). And low employability is one of the main root problems of postgraduate employment difficulties. Recruiters are increasingly concerned that a large proportion of the workforce lacks the necessary skills required by employers, with some recruiters claiming that graduates are not able to perform some of the competencies required for some roles, and that additional recruitment is therefore needed to fill the vacant competencies required for the roles (Thompson et al., 2013). Some research suggests that graduates' cognitive abilities and theoretical knowledge may be of increased value to them for hiring in the labor market (Tomlinson, 2008). From the current job market, employers pay more attention to personal qualities and skills than academic qualifications, which to a certain extent reflects the importance of employability in postgraduate for postgraduate employment.

The mentoring system is a well-established teaching method in postgraduate education around the world, and it is also the main system in China. However, since the number of postgraduate students is much larger than the number of supervisors, China's postgraduate education mainly adopts the "single supervisor system," which is different from the "dual supervisor system" in the United States, the United Kingdom, Australia and other countries (Gu et al., 2015). With the expansion of the number of postgraduate students, the supervision system in China has taken the form of "one to many." To a certain extent, in the postgraduate education system, the supervision of postgraduate students by supervisors is crucial. The "mentorship system" also means the responsibility system of the mentorship, that is to say, the responsibility of the supervisor to mentor the student is not limited to the guidance of his/her academic thesis, but also includes psychosocial guidance, career guidance, etc. (Kram, 1983; Paglis et al., 2006). In this process, the supervisor assumes the role of "guidance" and the postgraduate student assumes the role of "learning," which reflects the core of the relationship between the postgraduate student and the supervisor—the relationship between guidance and learning (Eby et al., 2006). A harmonious relationship between supervisor and postgraduate student is a prerequisite for ensuring the quality of postgraduate education, and an unhealthy relationship between supervisor and postgraduate student is the main cause of academic failure among postgraduate students. Therefore, the importance of the mentoring in the postgraduate education process should be emphasized.

Based on the above, this study focuses on the current state of postgraduate employment and aims to explore the impact of the mentoring on employment of postgraduate students and to further reveal the mediating role of postgraduate employability.

Literature review and research hypotheses

The expanding impact of economic globalization means that global labor markets are becoming increasingly competitive, which inevitably affects youth employment worldwide. Increased global mobility and wider participation in higher education have led to increased postgraduate mobility and significant increases in enrolment rates (Bunney, 2017). Unemployment among postgraduate graduates is inevitably growing and becoming more severe. The expansion of postgraduate education has led to over-education or diploma inflation, and higher education has moved from "elite education" to "mass education" (Lee, 2016; Støren and Wiers-Jenssen, 2016). The massification of higher education has exacerbated social inequality as well as educational inequality. Unprecedented diversity and varying employment outcomes for the postgraduate population in higher education, with barriers and difficulties encountered in postgraduate employment. The employment situation of postgraduates is not optimistic, given the problems of precarious employment, unemployment and skills mismatch, as well as the mismatch between the terms and conditions of employment offered by various industries and the expectations of postgraduate graduates (George and Paul, 2024). This study focuses on the current situation of employment satisfaction of postgraduate students and endeavors to improve it, which is a pressing issue. And employment satisfaction was investigated as our measure of graduate student employment.

The mentoring is a central issue in the field of research on postgraduate education, and a cordial mentoring is an important factor in the academic achievement and maintenance of wellbeing of postgraduate students (Ma, 2019; Liang et al., 2021). The relationship between the supervisor and the student has a direct impact on the progress of the research project, if the relationship between the supervisor and the student is harmonious and the graduate student is in a relaxed range, then it is very conducive to the successful completion of the research project, and vice versa, to a certain extent, to provide a hindrance to the advancement of the research project (Jake and Louisa, 2009; Reuven, 2016; David, 2020). The relationship between the supervisor and the student has a greater impact on the psychological health of postgraduate students, and a harmonious relationship between the supervisor and the student has a certain degree of inclusiveness, can play a role in motivating the students, which has a certain role in promoting the resistance of postgraduate students to external pressure (Woolston, 2022). More than that, the mentoring is critical to the development of graduate student competencies. There is a significant positive correlation between the competence of postgraduate students and the quality of supervision by their supervisors, which has been confirmed by the data obtained by the hand of Mehran et al. from the point of view of 137 postgraduate students from seven universities (Mehran et al., 2012). As a true nurturer of postgraduate students, the supervisor's style, leadership, academic achievements, talents, personality and values can support the development of postgraduate students' creativity (Daniel et al., 2001). To a certain extent, these may affect individual postgraduate students' abilities, thus directly or indirectly affecting postgraduate students' personal development, and the study of the impact of the

mentoring on the employment of postgraduate students and how it is produced is conducive to opening up postgraduate students' development pathways and providing support for postgraduate students' career development.

Factors such as the labor market, regulations, and the new coronavirus outbreak are all important factors affecting the employment of postgraduate students (Hu and Zhu, 2023). Individual ability, demographics, mentorship, and other factors will influence graduate employment at the micro level (Hu and Zhu, 2023). Mentoring is strongly associated with professional development and employment satisfaction, while task prioritization, job feedback and skill diversity are highlighted as affecting employment outcomes (Carless et al., 2012; Waaijer et al., 2017). Employability has been recognized as an important personal trait due to changes in business and production patterns and the growing demand for highly qualified and competent people (Krajnáková et al., 2020). Nevertheless, a notable gap is evident between the improved job prospects of graduate students and the more expansive set of expectations held by employers. These expectations go beyond the confines of disciplinary knowledge. Employers are seeking graduates equipped with a suite of organizational skills, including adaptability and strategic foresight, as well as a strong suite of business-oriented abilities, such as entrepreneurial initiative and a keen financial insight, among other critical skills (Solem et al., 2013). Enriched learning methods and practical skills, as well as more career-relevant experience and skills can help postgraduate students make the transition to the workforce (García-Aracil et al., 2018). Employability is broadly conceptualized as encompassing the ability of postgraduate individuals to secure and maintain employment that is consistent with their career goals, aspirations, and values (Fugate et al., 2003). Employability is a multidimensional concept that encompasses personal attributes, knowledge, skills and abilities required by the labor market (Van Der Heijden et al., 2009). Based on this, our study assesses postgraduate students' employability in terms of academic competence, personal quality competence.

Accordingly, this study proposed the following hypothesis:

H1. The mentoring showed a positive correlation with graduate student employment satisfaction. **H2.** Employability mediates the relationship between mentoring and employment satisfaction of graduate student.

Research method

Participants

In this study, data were collected from postgraduate students and postgraduate supervisors from six institutions of higher education in Heilongjiang province, including Northeast Forestry University, Northeast Agricultural University, Heilongjiang University, Harbin Normal University, Heilongjiang Bayi Agricultural Reclamation University and Mudanjiang Normal University. The reason for selecting these six universities for data collection is, on the one hand, that these six universities have different levels of teaching, among the aforementioned institutions, Northeast Forestry University and Northeast Agricultural University are designated as China's "Double

First-Class" universities, excelling in teaching and research with comprehensive discipline construction. Heilongjiang University and Harbin Normal University are key universities in Heilongjiang Province. Heilongjiang University, as a comprehensive university, has a wide range of disciplines and is highly recognized within the province for its teaching quality and research capabilities; Harbin Normal University, on the other hand, is strong in teacher education but may be less robust in other areas. Heilongjiang Bayi Agricultural Reclamation University and Mudanjiang Normal University, as provincial-run full-time ordinary universities, have relatively limited teaching resources and research capabilities, resulting in a lower overall teaching level. Thus, eliminating to a certain extent the factor that the level of university teaching affects postgraduate employment. On the other hand, they are comprehensive universities that include both humanities and social sciences majors as well as natural sciences majors, which is able to exclude the impact of differences in subject classification.

We administered the questionnaire through a combination of online and offline methods after obtaining consent from schools and participants. Participants were informed of the purpose and procedures of the study and were informed of their right to withdraw at any time. A total of 750 questionnaires were distributed to postgraduate students, and 725 valid questionnaires were collected. Male postgraduate students accounted for 46.5% ($n = 337$) and female postgraduate students accounted for 53.5% ($n = 388$). Humanities and social sciences postgraduate students made up 43.7% ($n = 317$), while science and engineering postgraduate students constituted 56.3% ($n = 408$).

Research instruments

Mentoring questionnaire

The self-developed mentoring questionnaire was used to examine postgraduate students' perceptions of the mentoring, comprising 18 items. The questionnaire includes three dimensions: recognition (three items), cultivation and guidance (five items), and supervisor-student interaction (six items). The questionnaire is scored on a 1–5 scale, with higher scores indicating better perceived mentoring (Supplementary Table S1). The development of the questionnaire items was guided by previous research on mentorings, emphasizing the importance of mutual recognition, effective guidance, and interactive communication between mentors and mentees (Zhou et al., 2010). Additionally, the structure and content of the items drew inspiration from validated scales in the field of mentoring and higher education, which focus on perceptions of mentoring processes and their impacts on mentees' outcomes (Heeneman and de Grave, 2019; Wendy et al., 2023). The Cronbach's α for the overall questionnaire was 0.881; the recognition dimension was 0.803; the cultivation and guidance dimension was 0.838; and the supervisor-student interaction dimension was 0.827. The confirmatory factor analysis for the three-factor model showed good fit: $\chi^2/df = 1.57$, CFI = 0.98, TLI = 0.97, RMSEA = 0.03, indicating good structural validity of the questionnaire.

Academic ability questionnaire

The self-developed academic ability questionnaire was used to assess postgraduate students' academic abilities, comprising 16 items. The questionnaire includes four dimensions: basic elements, technical elements, goal elements, and extended elements, each with four items. The questionnaire is scored on a 1–5 scale, with higher scores indicating better perceived academic abilities (Supplementary Table S2). The development of the questionnaire items was informed by prior research on the assessment of academic skills and competencies in higher education, particularly frameworks emphasizing basic knowledge, technical skills, goal orientation, and broader academic competencies (Sotiriadou et al., 2019; Paula et al., 2022). These studies provided valuable guidance in structuring the dimensions and crafting items that align with postgraduate academic skill sets. The reliability analysis demonstrated good internal consistency, with a Cronbach's α of 0.895 for the overall questionnaire. The reliability of each dimension was also acceptable: 0.811 for basic elements, 0.832 for technical elements, 0.804 for goal elements, and 0.803 for extended elements. The confirmatory factor analysis for the four-factor model showed good fit: $\chi^2/df = 2.23$, CFI = 0.96, TLI = 0.95, RMSEA = 0.04, indicating good structural validity of the questionnaire.

Personal quality and ability questionnaire

The self-developed personal quality and ability questionnaire was used to examine postgraduate students' personal qualities and abilities, comprising 16 items. The questionnaire includes four dimensions: innovation ability, self-learning ability, adaptability, and communication ability, each with four items. The questionnaire is scored on a 1–5 scale, with higher scores indicating better perceived personal qualities and abilities (Supplementary Table S3). The development of the questionnaire items was informed by recent studies on personal and professional competencies, focusing on the core qualities that contribute to postgraduate success. Research on innovation, self-directed learning, adaptability, and communication has highlighted the significance of these dimensions in higher education and career development (Maria, 2021). These dimensions were carefully constructed based on theoretical frameworks that emphasize the development of individual competencies necessary for both academic and professional success. The reliability analysis showed strong internal consistency, with a Cronbach's α of 0.898 for the overall questionnaire. The reliability of each dimension was also acceptable: 0.795 for innovation ability, 0.816 for self-learning ability, 0.817 for adaptability, and 0.820 for communication ability. The confirmatory factor analysis for the four-factor model showed good fit: $\chi^2/df = 2.62$, CFI = 0.97, TLI = 0.96, RMSEA = 0.05, indicating good structural validity of the questionnaire.

Employment capital questionnaire

The self-developed employment capital questionnaire was used to assess postgraduate students' employment capital, comprising 16 items. The questionnaire includes four dimensions: social capital, human capital, cultural capital, and psychological capital, each

with four items. The questionnaire is scored on a 1–5 scale, with higher scores indicating better perceived employment capital (Supplementary Table S4). The development of the questionnaire items was informed by recent theories and research on various forms of capital that contribute to individuals' employability and career development. The dimensions of social capital, human capital, cultural capital, and psychological capital are widely recognized as key determinants of employability (Voss, 2021; Nghia et al., 2023). These dimensions were constructed based on theoretical models that highlight the importance of individual and collective resources in enhancing career opportunities and outcomes (Gilleard, 2020; Fidelis et al., 2021). The Cronbach's α for the overall questionnaire was 0.886; the social capital dimension was 0.801; the human capital dimension was 0.814; the cultural capital dimension was 0.789; and the psychological capital dimension was 0.793. The confirmatory factor analysis for the four-factor model showed good fit: $\chi^2/df = 3.13$, CFI = 0.92, TLI = 0.91, RMSEA = 0.06, indicating good structural validity of the questionnaire.

Job satisfaction questionnaire

The self-developed job satisfaction questionnaire was used to assess postgraduate students' job satisfaction, comprising five items. The questionnaire is scored on a 1–5 scale, with higher scores indicating better perceived job satisfaction (Supplementary Table S5). The development of the questionnaire items was informed by established theories and frameworks on job satisfaction, particularly those emphasizing intrinsic and extrinsic factors affecting workplace satisfaction (Kauppila, 2024). Recent research on job satisfaction among early-career professionals and students transitioning into the workforce provided additional guidance for item construction, ensuring relevance to postgraduate contexts (Ng et al., 2024). The reliability analysis showed good internal consistency, with a Cronbach's α of 0.829 for the overall scale. The confirmatory factor analysis for the single-factor model showed good fit: $\chi^2/df = 1.23$, CFI = 0.99, TLI = 0.98, RMSEA = 0.02, indicating good structural validity of the questionnaire.

Data processing

Confirmatory factor analysis was conducted using Mplus 8.3 to verify the validity of the questionnaires used in this study. Harman's single-factor analysis was performed using SPSS 26.0 to test for common method bias. Pearson correlation analysis was used to examine the relationships among the research variables. Mediation analysis was conducted using PROCESS v3.3 (Model 4).

Results

Common method bias test

Harman's single-factor test revealed 16 factors with eigenvalues > 1 , with the first factor explaining 19.934% of the variance.

Therefore, the data of this study were not significantly affected by common method bias.

Descriptive statistics and correlation analysis

The dataset for this study mainly includes five key variables: mentoring (X), academic ability (O), personal quality and ability (W), employment capital (M), and job satisfaction (Y).

Mentoring (X): The mean score was 38.01 with a standard deviation of 4.82, indicating a high average level of mentoring in the sample with considerable variance among individual scores. Academic Ability (O): The mean score was 48.83 with a standard deviation of 5.33, showing a relatively balanced distribution of academic ability in the sample, but with some degree of variance. Personal Quality and Ability (W): The mean score was 49.72 with a standard deviation of 5.51, indicating high and consistent personal quality and ability in the sample.

Employment Capital (M): The mean score was 50.95 with a standard deviation of 5.23, showing high scores in employment capital with little variance among the sample. Job Satisfaction (Y): The mean score was 14.35 with a standard deviation of 2.11, indicating that most samples were quite satisfied with their employment status, though some variance in satisfaction was observed.

Pearson correlation analysis was conducted among mentoring (X), academic ability (O), personal quality and ability (W), employment capital (M), and job satisfaction (Y). The results are shown in Table 1. Table 1 indicates that there are significant positive correlations among the five variables, with correlation coefficients ranging from 0.29 to 0.37. Results are shown in Table 1.

Mediation analysis

Using Hayes' SPSS macro Process (Model 4), we examined the mediating role of academic ability, personal quality and ability, and employment capital in the relationship between mentoring and job satisfaction. The mentoring was treated as the independent variable, academic ability, personal quality and ability, and employment capital as mediating variables, and job satisfaction as the dependent variable.

The results indicated that: Mentoring (X) significantly positively affects academic ability (O) ($\beta = 0.426, p < 0.001$); Mentoring (X) significantly positively affects personal quality and ability (W) ($\beta = 0.417, p < 0.001$); Mentoring (X) significantly positively affects employment capital (M) ($\beta = 0.421, p < 0.001$); Mentoring (X) significantly positively affects job satisfaction (Y) ($\beta = 0.075, p < 0.001$); Academic ability (O) significantly positively affects job satisfaction (Y) ($\beta = 0.044, p < 0.001$); Personal quality and ability (W) significantly positively affects job satisfaction (Y) ($\beta = 0.062, p < 0.001$); Employment capital (M) significantly positively affects job satisfaction (Y) ($\beta = 0.055, p < 0.001$).

The total effect of mentoring (X) on job satisfaction (Y) was 0.143, with a Bootstrap 95% CI of [0.113, 0.173], indicating a significant total effect as the interval does not contain 0. After

including the mediating variables academic ability (O), personal quality and ability (W), and employment capital (M), the direct effect of mentoring (X) on job satisfaction (Y) was 0.075, with a Bootstrap 95% CI of [0.042, 0.109], indicating a significant direct effect as the interval does not contain 0.

The total indirect effect of the three mediating variables was 0.068, with a Bootstrap 95% CI of [0.051, 0.087], indicating a significant total indirect effect as the interval does not contain 0.

The indirect effect of academic ability (O) in the relationship between mentoring (X) and job satisfaction (Y) was 0.019, with a Bootstrap 95% CI of [0.007, 0.032], indicating a significant mediating effect of academic ability as the interval does not contain 0.

The indirect effect of personal quality and ability (W) in the relationship between mentoring (X) and job satisfaction (Y) was 0.026, with a Bootstrap 95% CI of [0.014, 0.039], indicating a significant mediating effect of personal quality and ability as the interval does not contain 0.

The indirect effect of employment capital (M) in the relationship between mentoring (X) and job satisfaction (Y) was 0.023, with a Bootstrap 95% CI of [0.010, 0.037], indicating a significant mediating effect of employment capital as the interval does not contain 0. Results are shown in Table 2 and Figure 1.

Discussion

The issue of postgraduate employment has become a social hot spot due to the expansion of educational scale and structural biases in the job market (Hu and Zhu, 2023). Against this backdrop, mentoring, as a core component of postgraduate education, is closely related to employment issues. I draw an analogy between the two as the "source" and "sink" model in biology: mentoring is like the fertile soil of knowledge and the source of skills, providing nutrients for the growth of postgraduates; while postgraduate employment is akin to the vast arena where the fruits cultivated from this soil can display their talents, serving as an important place for the reception, application, and utilization of knowledge and skills. This analogy is closely related to the mentoring model for postgraduates in Chinese universities. Mentoring can be defined as a one-on-one relationship between experienced mentors and less experienced colleagues, offering a variety of career development and growth functions (Green and Bauer, 1995). In Chinese universities, the one-on-one mentorship provided by mentors is highly customized, guiding not only academic exploration but also playing a crucial role in the development of students into independent researchers. Mentors enhance the academic abilities and career potential of postgraduates through personalized coaching, participation in seminars, and academic exchanges. The demonstration of students' abilities in various aspects and the outcomes of employment serve as direct manifestations of the mentoring results. Mentoring is carried out throughout the whole cultivation process, and which plays a key role in the quality of postgraduate cultivation. Most of the postgraduate students' competences can be developed or enhanced in this process, which undoubtedly points to the important role played by the mentoring in the development of postgraduate students' competences in various aspects. A study by Mehran et al. confirms

TABLE 1 Descriptive statistics and correlation matrix of factors.

Factor	Mean	SD	X	O	W	M	Y
X. Mentoring	38.01	4.82	1				
O. Academic ability	48.83	5.33	0.38***	1			
W. Personal quality and ability	49.72	5.51	0.36***	0.37***	1		
M. Employment capital	50.95	5.23	0.39***	0.36***	0.36***	1	
Y. Job satisfaction	14.35	2.11	0.33***	0.29***	0.32***	0.30***	1

The *, ** and *** was significance at $p < 0.05$, $p < 0.01$ and $p < 0.001$, respectively.

TABLE 2 Mediation effect analysis table.

Path	Effect	BootSE	BootLLCI	BootULCI
Total effect	0.143	0.015	0.113	0.173
Direct effect	0.075	0.017	0.042	0.109
Total indirect effect	0.068	0.009	0.051	0.087
X->O->Y	0.019	0.006	0.007	0.032
X->W->Y	0.026	0.006	0.014	0.039
X->M->Y	0.023	0.007	0.01	0.037

that mentoring can have a significant positive effect on graduate student competence (Mehran et al., 2012). Our study found that the mentoring significantly and positively moderated all three aspects of postgraduate students' academic competence, personal quality competence, and employment capital, is in line with the findings of previous studies.

As research into postgraduate employment deepens, the focus shifts toward improving the quality of employment and coping with the diversity of employment choices (Hu and Zhu, 2023). Studies have shown that the mentoring relationship is positively correlated with career development and job satisfaction, while emphasizing that task prioritization, work feedback, and skill diversity influence career placement outcomes (Carless et al., 2012; Waaijer et al., 2017). Our correlation analysis results indicate a significant positive correlation between postgraduate mentoring relationships and job satisfaction, which is consistent with previous research findings. However, the differences in the impact of various aspects of mentor guidance (such as academic guidance, emotional support, etc.) on job satisfaction have not been thoroughly investigated, which is also worthy of further research and exploration.

It has been shown that employability highly influences the quality of employment (Pang, 2020). Employability can be defined as the aggregate of soft and hard skills and competencies that graduates acquire to meet and fulfill the requirements of their ideal job and achieve success in their careers (Amarathunga et al., 2024). Employability consists of a range of abilities, experiences, attitudes, and personal skills that can be seen as the ability to get a job, keep that job or find another job, which also suggests that employability may have a positive effect on employment outcomes (Matsouka and Mihail, 2016). Through empirical research, Peng et al. also found that employability has a significant positive impact on college graduates' job characteristic satisfaction, career

matching, and employment satisfaction (Peng et al., 2020). And the idea that employment capital, including human capital and social capital, plays a positive and dominant role in influencing the quality of employment has also been argued (Blalock et al., 1967). And in this study, all three aspects of graduate student employability, academic ability, personal quality ability, and employment capital, play a positive moderating effect on employment satisfaction, and this conclusion we obtained has similarities with the results of previous studies. By improving graduate student employability, we can increase graduate student employment satisfaction and can effectively promote graduate student employment, which is crucial for the current employment environment, and this also needs to attract the attention of graduate education administrators urgently.

Tholen (2014) and Guilbert et al. (2016) propose that employability encompasses internal and external factors, where internal factors include personal knowledge and job-specific skills, while external factors pertain to the demands of the labor market. As suggested by Yorke et al. and Tholen et al., employability skills are divided into those related to individual capabilities and a set of competitive skills (Yorke and Knight, 2007; Finch et al., 2013; Tholen, 2014). Employability usually refers to three areas of competence: generic skills, discipline-specific skills and personal attributes (Lisá et al., 2019). Numerous authors agree that generic skills mainly include teamwork, communication skills, organization, and planning. Skills in engineering, law, social work, etc. are discipline-specific skills. Whereas, aspects such as self-confidence, resilience, loyalty and integrity belong to personal traits (Tupa, 2016). The results of our analysis reveal a significant positive correlation between postgraduates' academic capabilities, personal quality attributes, employment capital, and employability, which is largely in line with the findings of other scholars. Building on this, we further investigated the mediating role of employability in terms of academic capabilities, personal qualities, and employment capital between the mentoring relationship and postgraduate job satisfaction. Our aim was to uncover the factors influencing job satisfaction at the individual level, thereby assisting postgraduates in achieving their career planning. Our research findings indicate that academic capabilities, personal qualities, and employment capital indeed serve as mediators between the mentoring and postgraduate job satisfaction. However, further research is needed on the specific mediating mechanisms of these three employability factors between mentoring and job satisfaction, including how these factors interact with each other and the extent of their influence.

Mentoring can directly influence the personal abilities of postgraduate students, thereby affecting the quality of their

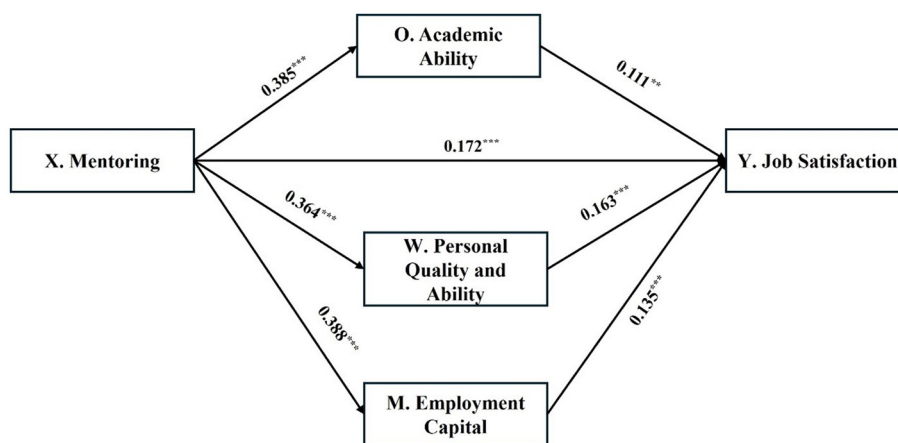


FIGURE 1 Completely standardized path coefficient. The ** and *** was significance at $p < 0.01$ and $p < 0.001$, respectively.

employment, which is of vital importance for postgraduate employment. We will investigate the essence of this impact. Several studies have found that the mentoring is influenced by a variety of factors and that numerous predictor variables are key determinants of the mentoring, including age, prior educational background, gender, attendance status, knowledge environment, funding, and expectations (David, 2020). In addition, in the process of postgraduate students being guided by their supervisors, the supervisors' arrangement of tasks for postgraduate students, their attitudes, help and understanding in the process of communication all affect the supervisory relationship (Le et al., 2021). Moreover, the mentor's mentoring style (including directive, supportive, laissez-faire, collaborative, mixed or eclectic, etc.) and the adequacy of the time for mentoring are also important factors affecting the mentoring (Rombeau et al., 2010). Rombeau et al. (2010) explored the mentoring between a surgeon and his student, in which the fairness of the remuneration, the adequacy of the time, the depreciation of the mentoring activity, and the formality of the mentoring all affect the rapport between the teacher and student, which has parallels with the research of other scholars. Therefore, this study used teacher-student interaction, nurturing guidance, and buy-in as the three subscales of the mentoring to assess the strengths and weaknesses of the mentoring. All of the above factors, not only these factors, can affect the tutorial relationship directly or indirectly. While these factors are all representations, exploring the inner causes of these factors and proposing solutions and measures can achieve the purpose of fundamentally improving the mentoring, which is of great significance for postgraduate education. We suggest that the unequal status of mentoring and the perceived imbalance in the mentoring may be two of the essential factors in the lack of rapport between mentoring and learning.

We have analyzed the current state of the postgraduate mentoring and found that there is currently a mismatch in the status of mentoring. As a matter of fact, supervisors play a very influential and decisive role in both the "entry" and "exit" of postgraduate students. On the one hand, under the background of the massive expansion of postgraduate enrolment, the so-called two-way choice between tutors and students is, in essence, more

of a tutor-selected student, with the supervisor in the status quo of "one chooses many," while the student can only choose the only tutor, and the supervisor has become the main decision-maker as to whether or not the student can go on to higher education. On the other hand, regarding the matter of graduate school graduation, the supervisor plays an equally decisive role. The supervisor's evaluation of the completion of the graduate student's project, thesis, and other aspects of the graduate student is an important basis for judging whether the graduate student can be graduated, but also the first threshold for the graduate student to obtain the degree certificate, and it can not be skipped. This also leads to a more intimidating mindset for students facing their tutors and some possible biases in their perception of their tutors' daily behaviors, making the mentoring relationship increasingly strained. We speculate that this may be one of the essential factors in the lack of rapport between the guides. According to our proposal, if the mechanism for admission to graduate schools can be adjusted to achieve a genuine "double-selection system," it may be able to solve part of the problem to a certain extent. On the other hand, we suggest that the assessment system for supervisors be strengthened, which involves not only the assessment of supervisors' achievements, but also the assessment and evaluation of supervisors by students.

Another essential factor in the lack of rapport in the instructor-learner relationship, we suspect, may be the perceived imbalance in the instructor-learner relationship. At the heart of so-called mentorship is not the mentor, but the mentee. The mentee is able to derive a certain amount of benefit from being nurtured and developed by the mentor, and the mentor derives a certain amount of satisfaction, which is, of course, negligible compared to the former (Koven, 2024). However, most tutors currently do not have this understanding of the role of "mentor." They are more likely to belittle the competencies that students possess and to see them as finishers of the subject matter. Instead, there is no sense of nurturing students and promoting their development, nor is there any concern for the pressures faced by students and the dilemmas they face, whether academic, psychological or employment-related. As it stands, most tutors do not see their students as subjects

and do not appreciate the satisfaction that student development brings them. As far as students are concerned, it is difficult for them to get humanistic care from their supervisors, and they regard their supervisors as “superiors” and “bosses” more often than not. This perception makes the gap between supervisors and postgraduates deepen, and the relationship between supervisors and postgraduates becomes more and more alienated. We believe that if this situation is improved, the mentoring relationship may be alleviated. We suggest that colleges and universities strengthen the training of tutors so that tutors can change their concepts, while faculties and departments set up special departments to carry out daily communication between tutors and students to promote the construction of a new type of tutoring relationship.

Limitations and implications for future research

The survey respondents of this study come from six universities in Heilongjiang Province, which has certain local attributes. All of these universities come from one province, Heilongjiang, which is different from other provinces in terms of education system, education structure, and teaching level (including investment in education, number of colleges and universities, and faculty strength, etc.). And the representativeness of the sample size may be affected to a certain extent, so the scope of the survey respondents can be expanded, and the study can be carried out based on different levels, different regions, different genders, and different fields, respectively. In addition, this study is based on the students' perspective to investigate the correlation between mentoring and employment satisfaction, and the survey of mentoring relationship satisfaction with tutors as the target can be added to compare the two horizontally for further research. In addition, interviews can be conducted with tutors and the students they supervise as the research objects to exchange the points of conflict between tutors and students, deeply analyze the influencing factors affecting the mentoring relationship, and propose effective strategies.

Conclusion

This research found that there is a significant positive correlation between postgraduate students' mentoring and employment satisfaction of postgraduate students. The direct effect of the influence of mentoring on employment satisfaction is significant. A cordial mentoring helps to promote the employment of postgraduate students. The mediating effect of postgraduate students' employability (academic competence, personal quality competence, and employment capital) on the relationship between the mentoring and postgraduate students' employment satisfaction is significant.

Data availability statement

The original contributions presented in the study are included in the article/[Supplementary material](#), further inquiries can be directed to the corresponding author.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent was provided by the participants.

Author contributions

XJ: Methodology, Supervision, Writing – original draft, Writing – review & editing. HW: Data curation, Software, Supervision, 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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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/feduc.2025.1470902/full#supplementary-material>

SUPPLEMENTARY TABLE S1
Mentoring questionnaire.

SUPPLEMENTARY TABLE S2
Academic ability questionnaire.

SUPPLEMENTARY TABLE S3
Personal quality and ability questionnaire.

SUPPLEMENTARY TABLE S4
Employment capital questionnaire.

SUPPLEMENTARY TABLE S5
Job satisfaction questionnaire.

References

- Amarathunga, B., Khatibi, A., Talib, Z. M., Azam, S. M. F., and Tham, J. (2024). Graduate employability skills, trending avenues and research gaps: a systematic literature review and bibliometric analysis. *Asian Educ. Dev. Stud.* 13, 320–339. doi: 10.1108/AEDS-04-2024-0085
- Amida, A., Algarni, S., and Stupnisky, R. (2020). Testing the relationships of motivation, time management, and career aspirations on graduate students' academic success. *J. Appl. Res. Higher Educ.* 13, 1305–1322. doi: 10.1108/JARHE-04-2020-0106
- Blalock, H. M., Blau, P. M., Duncan, O. D., and Tyree, A. (1967). The American occupational structure. *Am. Sociol. Rev.* 33:296. doi: 10.2307/2092399
- Bunney, D. (2017). Facilitating the transition to postgraduate studies: what can we learn from the first year experience? *J. Acad. Lang. Learn.* 11, A23–A38.
- Carless, S. A., Robertson, K., Willy, J., Hart, M., and Chea, S. (2012). Successful postgraduate placement experiences: what is the influence of job and supervisor characteristics? *Aust. Psychol.* 47, 156–164. doi: 10.1111/j.1742-9544.2012.00085.x
- Daniel, C. F., Daniel, F. M., Makoto, N., and Sumiko, H. (2001). Development of the sport interest inventory (SII): implications for measuring unique consumer motives at team sporting events. *Int. J. Sports Market. Spons.* 3, 38–63. doi: 10.1108/IJMSMS-03-03-2001-B005
- David, O. A. (2020). "To be or not to be?" The effect of supervisor-supervisee relations on students' completion of doctoral studies. *World J. Educ.* 10:23. doi: 10.5430/wje.v10n1p23
- Eby, L. T., Durlley, J. R., Evans, S. C., and Ragins, B. R. (2006). The relationship between short-term mentoring benefits and long-term mentor outcomes. *J. Vocat. Behav.* 69, 424–444. doi: 10.1016/j.jvb.2006.05.003
- Fidelis, A., Fernandes, A., Rech, J., and Tisott, P. (2021). Relationship between psychological capital and motivation: study in health organizations of southern Brazil. *Int. J. Innov. Educ. Res.* 9, 186–201. doi: 10.31686/ijer.vol9.iss3.2989
- Finch, D. J., Hamilton, L. K., Baldwin, R., and Zehner, M. (2013). An exploratory study of factors affecting undergraduate employability. *Educ. Train.* 55, 681–704. doi: 10.1108/ET-07-2012-0077
- Fugate, M., Kinicki, A. J., and Ashforth, B. E. (2003). Employability: a psychosocial construct, its dimensions, and applications. *J. Vocat. Behav.* 65, 14–38. doi: 10.1016/j.jvb.2003.10.005
- García-Aracil, A., Monteiro, S., and Almeida, L. S. (2018). Students' perceptions of their preparedness for transition to work after graduation. *Active Learn. Higher Educ.* 22, 49–62. doi: 10.1177/1469787418791026
- George, R. I., and Paul, B. (2024). Unravelling the interplay between competencies, career preparedness, and perceived employability among postgraduate students: a structural model analysis. *Asia Pacific Educ. Rev.* 25, 439–457. doi: 10.1007/s12564-023-09896-4
- Gilleard, C. (2020). Bourdieu's forms of capital and the stratification of later life. *Journal of Aging Studies* 53, 100851. doi: 10.1016/j.jaging.2020.100851
- Green, S. G., and Bauer, T. N. (1995). Supervisory mentoring by advisers: relationships with doctoral student potential, productivity, and commitment. *Personnel Psychol.* 48, 537–562. doi: 10.1111/j.1744-6570.1995.tb01769.x
- Gu, J., He, C., and Liu, H. (2015). Supervisory styles and graduate student creativity: the mediating roles of creative self-efficacy and intrinsic motivation. *Stud. Higher Educ.* 42, 1–22. doi: 10.1080/03075079.2015.1072149
- Guilbert, L., Bernaud, J.-L., Gouvernet, B., and Rossier, J. (2016). Employability: review and research prospects. *Int. J. Educ. Vocat. Guid.* 16, 69–89. doi: 10.1007/s10775-015-9288-4
- Heeneman, S., and de Grave, W. (2019). Development and initial validation of a dual-purpose questionnaire capturing mentors' and mentees' perceptions and expectations of the mentoring process. *BMC Med. Educ.* 19:133. doi: 10.1186/s12909-019-1574-2
- Hu, Y., and Zhu, X. (2023). A bibliometric and visual analysis of Chinese and international postgraduate employment in the last decade: developments, hotspots, and trend directions. *Front. Soc. Sci. Technol.* 5, 91–102. doi: 10.25236/FSST.2023.050515
- Jake, J. P., and Louisa, L. (2009). An exploration of themes that influence the counselor education doctoral student experience. *Counsel. Educ. Supervis.* 48, 239–256. doi: 10.1002/j.1556-6978.2009.tb00078.x
- Kauppila, O. P. (2024). Revisiting the relationships between leadership and job satisfaction. *Euro. Manage. Rev.* 1–15. doi: 10.1111/emre.12637
- Koven, S. (2024). What Is a Mentor? *The New England journal of medicine* 390, 683–685. doi: 10.1056/NEJMp2313304
- Krajnáková, E., Pilinkienė, V., and Bulko, P. (2020). Determinants of economic development and employability of higher education institutions graduates. *Eng. Econ.* 31, 211–220. doi: 10.5755/j01.ee.31.2.24751
- Kram, K. E. (1983). Phases of the mentor relationship. *Acad. Manage. J.* 26, 608–625. doi: 10.2307/255910
- Kuzhabekova, A. (2021). Charting the terrain of global research on graduate education: a bibliometric approach. *J. Further Higher Educ.* 46, 20–32. doi: 10.1080/0309877X.2021.1876219
- Le, M., Pham, L., Kim, K., and Bui, N. (2021). The impacts of supervisor – PhD student relationships on PhD students' satisfaction: a case study of Vietnamese universities. *J. Univ. Teach. Learn. Pract.* 18, 269–285. doi: 10.53761/1.18.4.18
- Lee, S.-y. (2016). Massification without equalisation: the politics of higher education, graduate employment and social mobility in Hong Kong. *J. Educ. Work* 29, 13–31. doi: 10.1080/13639080.2015.1049024
- Liang, W., Liu, S., and Zhao, C. (2021). Impact of student-supervisor relationship on postgraduate students' subjective well-being: a study based on longitudinal data in China. *Higher Educ.* 82, 273–305. doi: 10.1007/s10734-020-00644-w
- Lisá, E., Hanelová, K., and Newman, D. (2019). Comparison between employers' and students' expectations in respect of employability skills of university graduates. *Int. J. Work Integrated Learn.* 20, 71–82.
- Ma, R. (2019). Advanced academic literacy development: a case study of a successful Chinese doctoral student. *Lang. Cult. Curric.* 32, 207–222. doi: 10.1080/07908318.2018.1540633
- Maria, T. (2021). Self-regulated learning training programs enhance university students' academic performance, self-regulated learning strategies, and motivation: a meta-analysis. *Contemp. Educ. Psychol.* 66:101976. doi: 10.1016/j.cedpsych.2021.101976
- Matsouka, K., and Mihail, D. M. (2016). Graduates' employability: what do graduates and employers think? *Indus. Higher Educ.* 30, 321–326. doi: 10.1177/0950422216663719
- McAlpine, L., Castello, M., and Pyhäntö, K. (2020). What influences PhD graduate trajectories during the degree: a research-based policy agenda. *Higher Educ.* 80, 1011–1043. doi: 10.1007/s10734-019-00448-7
- Mehran, M., Mohammad, K., and Sajadi, S. N. (2012). A study of the capabilities of graduate students in writing thesis and the advising quality of faculty members to pursue the thesis. *Proc. Soc. Behav. Sci.* 31, 5–9. doi: 10.1016/j.sbspro.2011.12.006
- Ng, T. W. H., Yim, F. H. K., Chen, H., and Zou, Y. (2024). Employer-sponsored career development practices and employee performance and turnover: a meta-analysis. *J. Manage.* 50, 685–721. doi: 10.1177/01492063221125143
- Nghia, T., Anh, N., and Kien, L. (2023). "English language skills and employability: a theoretical framework," in *English Language Education for Graduate Employability in Vietnam*, eds. T. L. H. Nghia, L. T. Tran, and M. T. Ngo (Singapore: Springer), 71–93. doi: 10.1007/978-981-99-4338-8_4
- Paglis, L. L., Green, S. G., and Bauer, T. N. (2006). Does adviser mentoring add value? A longitudinal study of mentoring and doctoral student outcomes. *Res. Higher Educ.* 47, 451–476. doi: 10.1007/s11162-005-9003-2
- Pang, F. (2020). The influence of college students'employability on the quality of employment. *J. HUBEI Open Vocat. Coll.* 33, 47–48. doi: 10.3969/j.issn.2096-711X.2020.23.021
- Paula, C., José, M. G. R., and Marián, Q. D. (2022). Project-based learning (PBL) and its impact on the development of interpersonal competences in higher education. *J. New Approach. Educ. Res.* 11, 259–276. doi: 10.7821/naer.2022.7.993
- Peng, Z., Lu, G., and Li, L. (2020). Research on graduates' employment quality: influence factors and path analysis. *China Higher Educ. Res.* 1, 57–64. doi: 10.16298/j.cnki.1004-3667.2020.01.09
- Reuven, K. (2016). Challenges in doctoral research project management: a comparative study. *Int. J. Doct. Stud.* 11, 105–125. doi: 10.28945/3419
- Rombeau, J., Goldberg, A., and Loveland-Jones, C. (2010). "How to choose a mentor," in *Surgical Mentoring* (New York, NY: Springer), 133–144. doi: 10.1007/978-1-4419-7191-3_8
- Solem, M., Kollasch, A., and Lee, J. (2013). Career goals, pathways and competencies of geography graduate students in the USA. *J. Geogr. Higher Educ.* 37, 92–116. doi: 10.1080/03098265.2012.729563
- Sotiriadou, P., Logan, D., Daly, A., and Guest, R. (2019). The role of authentic assessment to preserve academic integrity and promote skill development and employability. *Stud. Higher Educ.* 45, 1–17. doi: 10.1080/03075079.2019.1582015
- Storen, A. L., and Wiers-Jenssen, J. (2016). Transition from higher education to work: are master graduates increasingly over-educated for their jobs? *Tertiary Educ. Manage.* 22, 134–148. doi: 10.1080/13583883.2016.1174290
- Tang, T., Aldhacebi, M. A., Lan, J. Q., and Bamanger, E. (2020). Comparison of the graduate education between Canada and China. *Int. J. Higher Educ.* 9:13. doi: 10.5430/ijhe.v9n4p13
- Tholen, G. (2014). Graduate employability and educational context: a comparison between Great Britain and the Netherlands. *Br. Educ. Res. J.* 40, 1–17. doi: 10.1002/berj.3023

- Thompson, L. J., Clark, G., Walker, M., and Whyatt, J. D. (2013). 'It's just like an extra string to your bow': exploring higher education students' perceptions and experiences of extracurricular activity and employability. *Active Learn. Higher Educ.* 14, 135–147. doi: 10.1177/1469787413481129
- Tomlinson, M. (2008). 'The degree is not enough': students' perceptions of the role of higher education credentials for graduate work and employability. *Br. J. Sociol. of Educ.* 29, 49–61. doi: 10.1080/01425690701737457
- Tupa, M. (2016). "Impacts of labour migration on development and amount of salary," in *SGEM, 2016: Political Sciences, Law, Finance, Economics and Tourism, Conference Proceedings V* (Albena), 321–328.
- Van Der Heijden, B., Boon, J., Van Der Klink, M., and Meijs, E. (2009). Employability enhancement through formal and informal learning: an empirical study among Dutch non-academic university staff members. *Int. J. Train. Dev.* 13, 19–37. doi: 10.1111/j.1468-2419.2008.00313.x
- Voss, T. (2021). "James S. Coleman: foundations of social theory," in *Schlüsselwerke der Wirtschaftssoziologie*, eds. K. Kraemer and F. Brugger (Wiesbaden: Springer Fachmedien Wiesbaden), 223–234. doi: 10.1007/978-3-658-31439-2_19
- Waaiker, C. J. F., Belder, R., Sonneveld, H., Bochove, C. A. v., and Weijden, I. C. M. v.d. (2017). Temporary contracts: effect on job satisfaction and personal lives of recent PhD graduates. *Higher Educ.* 74, 321–339. doi: 10.1007/s10734-016-0050-8
- Wendy, N., Mien, S., and Simon, B. (2023). Measuring mentoring in employability-oriented higher education programs: scale development and validation. *Higher Educ.* 87, 21–23. doi: 10.1007/s10734-023-01042-8
- Woolston, C. (2022). Stress and uncertainty drag down graduate students' satisfaction. *Nature* 610, 805–808. doi: 10.1038/d41586-022-03394-0
- Yorke, M., and Knight, P. (2007). Evidence-informed pedagogy and the enhancement of student employability. *Teach. Higher Educ.* 12, 157–170. doi: 10.1080/13562510701191877
- Zhou, W., Zhang, A., Liu, J., Zhao, Q., and Zhao, Y. (2010). Investigation of the current state of postgraduate and mentor relationships in Chinese universities. *Grad. Educ. Degree* 9, 7–14. doi: 10.16750/j.adge.2010.09.002