An Empirical Study on Mentoring Satisfaction of Master's Students

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ABSTRACT

Postgraduate education shoulders the important mission of high-level talent cultivation and innovation and creation, and is an important cornerstone of national development and social progress, as well as a basic layout to cope with global talent competition. As the first responsible person of postgraduates, the supervisor is the key link of postgraduates' cultivation. In order to investigate the satisfaction of postgraduates with their supervisors' guidance, this study uses a questionnaire to launch a survey on the satisfaction of supervisors' guidance and conducts an analysis of the influencing factors through structural equation modeling. The results show that postgraduates are more satisfied with the ideological education and humanistic care, and less satisfied with the academic guidance and development planning. There are significant differences in the satisfaction of postgraduates with different characteristics in terms of their tutors' research guidance and academic development planning; humanistic care is a key factor influencing the satisfaction of tutors' guidance. Based on the results of the study, relevant suggestions are put forward at the level of mentors and postgraduates themselves respectively, with a view to providing new ideas, references and references for the work of the university.

Keywords: *Postgraduate education, Mentoring satisfaction, Empirical research, Structural equation modelling.*

1. INTRODUCTION

In September 2020, the Ministry of Education, the National Development and Reform Commission and the Ministry of Finance jointly issued the Opinions on Accelerating the Reform and Development of Postgraduate Education in the New Era, which proposed to build a strong country with Chinese characteristics in postgraduate education by 2035. The key measures for the reform and development of postgraduate education were proposed in terms of strengthening ideological and political education, promoting the adjustment of disciplines and specialties, improving the talent cultivation system, upgrading the level of supervisors, strict quality management, and improving the conditions and guarantee. However, as the scale of postgraduate education continues to expand, the teacher-student ratio also gradually expands. In the process of postgraduate training, the supervisor, as the first responsible person for postgraduate students, is the key link in the cultivation of postgraduate students, and supervisory guidance is also an important way to improve the research ability of postgraduate students. The mentoring situation has thus become one of the focal points of public attention, and is limited to the pressure between the various roles of mentors themselves.

2. STUDY DESIGN

2.1. Graduate student mentoring evaluation index construction

2.2.1. Literature analysis and expert interviews

This study defines the connotation, characteristics, and constituent elements of graduate student mentoring by reviewing a large amount of relevant literature and integrating previous experiences and research results. Most scholars evaluate mentoring in terms of mentoring relationship, mentoring style, mentoring mode, and research guidance. This study initially designed three dimensions of academic guidance, development planning and humanistic care for mentoring evaluation. In order to make the evaluation indexes more scientific, reasonable

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and in line with the characteristics of the research subjects. The study developed an interview outline and selected six experts to conduct interviews, collected and adopted relevant opinions, and formed a prototype framework of the mentoring satisfaction index system.

After the expert consultation opinions, the evaluation index system of graduate student supervision was finally determined, and the subject group conducted the second round of expert consultation opinions again, and the experts' opinions all converged, and the evaluation index system of graduate student supervision satisfaction was finally determined, as shown in Table 1.

Table 1 Mentoring satisfaction evaluation index system for graduate students

Dimensions1	Dimensions2	Dimensions3
Ideological and political education	Establishing moral values and educating people	a model for others
		Fostering positive perceptions
		Establishing ethical concepts
	Thinking and Leading	Civic Education
		Moral influence
		Socialist core values leading
Academic Advising	Basic Guidance	Guidance scale
		Guidance frequency
		Guidance method
		Mentoring Style
	Scientific Research Guidance	Teaching content
		Develop a research plan
		Inspection completion
		Academic Discussion
		Dissertation guidance
	Practical guidance	Participation in project topics
		Professional Skills
		Creative thinking development
		Hands-on exercise
Development Planning	Academic Development Planning	Communicate the concept of further education
		Propose academic development
		Provide access to resources
	Career Development Planning	Professionalism
		Career Planning
		Provide employment assistance
Human emotions	Mentor-Student Relationship	Teacher and student communication
		Atmosphere
		Physical and mental care
	Academic attitude	Mentorship attitude
		Attitude development
		Mentorship attitude
	Organizational Management	Student interpersonal skills
		Team atmosphere
		Organizational coordination

2.2. Data collection and processing

A random sample survey was conducted with a graduate student of a university in western China in the classes of 2019, 2020 and 2021 as the main research target. In order to facilitate the recovery of sufficient sample size, the questionnaire was distributed and recovered in the form of online questionnaire survey. A total of 638 questionnaires were distributed, 638 questionnaires were collected, 578 questionnaires were valid, and the effective recovery rate of questionnaires was 90.6%.

In this study, SPSS 25.0 was utilized to analyze the reliability and validity of this questionnaire. The Cronbach alpha coefficient was used in this questionnaire to conduct the reliability test. As shown in Table 2, the coefficient of Cronbach alpha was 0.961, which was greater than 0.8, indicating that the reliability of the questionnaire had good internal consistency and reliability.

Table 2 Reliability statistics

Cloning of Bach Alpha based on standardized terms	Number of items
0.961	47

The validity of the questionnaire was analyzed for internal consistency using Cronbach alpha. As shown in Table 3, the KMO measure was 0.932, which was much greater than 0.7, and $p=0.000<0.05$, which was significantly different and the validity of the questionnaire was favorable.

Table 3 KMO and Bartlett's test

KMO Sampling suitability quantity		0.978
Bartlett's sphericity test	Approximate cardinality	27350.049
	DF	741
	P	0.000

3. DATA ANALYSIS

3.1. Distribution of basic characteristics of the sample

As shown in Tables 4 and 5, among the valid subjects: 79 male, 499 female, 199 academic graduate students, 379 professional graduate students, 464 humanities, 114 science and technology, 329 research students, 150 research students, and 99 research students.The copyright form is located on the authors' reserved area.Among the instructors, there are 388 male instructors, 190 female instructors, 393 professors, 175 associate professors, 10 lecturers, etc., 219 instructors holding administrative positions, and 359 instructors not holding administrative positions.

Table 4 Distribution of information characteristics of the graduate student sample

	Features	Number of times	Percentage %
Gender	Male	79	13.7
	Female	499	86.3
Grade	Grade 1 master	329	56.9
	Grade 2 master	150	26.0
	Grade 3 master	99	17.1
Academic Type	Academic	199	34.4
	Professional	379	65.6
Subject Type	Humanities	464	80.2
	Science & Engineering	114	19.7

Table 5 Distribution of information characteristics of the mentor sample

	Features	Number of times	Percentage %
Mentor Age	35 years old and below	17	2.9
	36-45 years old	249	43.1
	46-55 years old	222	38.4
	56-65 years old	90	15.6
Mentor Gender	Male	388	67.1
	Female	190	32.9
Instructor Title	Professor	393	68.0
	Associate Professor	175	30.3
	Lecturer	10	1.7
Whether to hold an executive position	Y	219	37.9
	N	359	62.1

3.2. Graduate Student Mentoring Overview

Through literature research and expert consultation, the mentoring is divided into four dimensions: ideological education, academic guidance, development planning, and humanistic care to understand the satisfaction of graduate students with mentoring.

3.2.1. Overall satisfaction with mentorship

The results of the analysis are shown in Figure 1-5: the overall satisfaction with the mentor's guidance reaches 90% through descriptive statistics to evaluate five dimensions as the satisfaction with mentor's guidance: thinking and education, academic guidance, development planning and humanistic care and overall guidance. The overall satisfaction of graduate students with the mentor's guidance on political education reaches 94%, the overall satisfaction with academic guidance reaches 89.6%, the overall satisfaction with development planning guidance reaches 87.6%, and the overall satisfaction with humanistic care reaches 91.31%. The data show that graduate students have a high recognition of mentoring in general, and in comparison, there is still room for improvement in academic guidance and development planning.

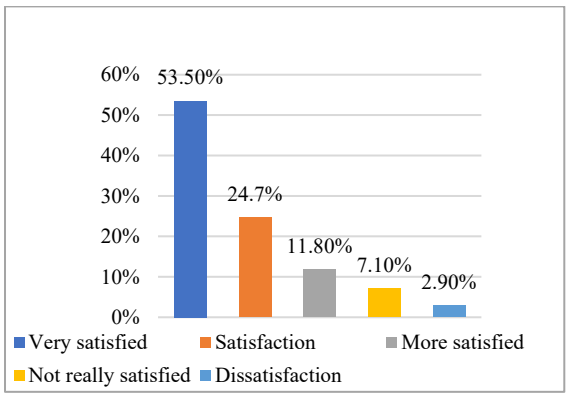

Figure 1 Overall mentoring satisfaction of mentors

3.2.2. Overall satisfaction with mentorship

The difference analysis reveals that there are significant differences in the satisfaction of graduate students of different grades and different academic types with specific guidance from their mentors. From Figure 6, it can be seen that the mean value of satisfaction with mentors in terms of thinking and education, academic guidance, development planning, and humanistic care is smaller for students in the second year of study than for those in the first and third year of study, and that graduate students in the second year of study are in the stage of rapid development in all aspects, have their own opinions and higher requirements for all aspects of study life, so they show lower satisfaction than those in the first and third year of study. From Figure 7, it can be seen that the average satisfaction value of professional graduate students in terms of mentor's thinking and education, academic guidance, development planning, and humanistic care is smaller than that of academic graduate students, which is influenced by the cultivation goal and program, academic graduate students aim to cultivate talents with higher academic level, and in the process of cultivation, the curriculum and academic activities are set with focus, while professional graduate students aim to cultivate themselves to adapt to the workplace Therefore, they show the difference in academic guidance between academic and professional graduate students.

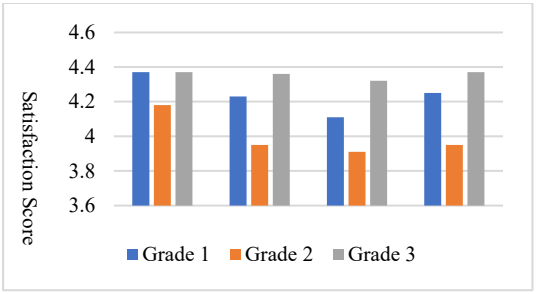

Figure 2 Mentoring satisfaction by grade level

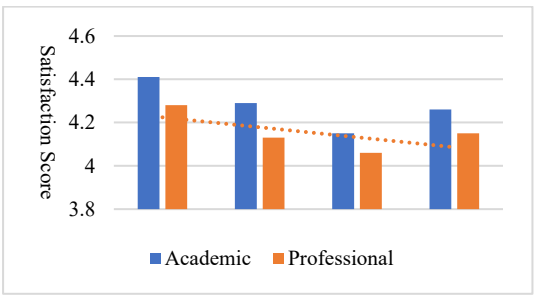

Figure 3 Mentoring satisfaction of different master categories

3.3. Analysis of the specific situation of graduate student mentoring

3.3.1. Variance Analysis

In order to analyze whether the basic characteristics of different samples would be associated with mentoring, the following tests were done to examine the differences between different graduate students' gender, grade, category, and discipline type and different mentors' gender, age, position, and title on the specific situation of mentoring, aiming to understand whether there are significant differences between graduate students' satisfaction with specific mentoring in different backgrounds.

3.3.1.1. Gender

As shown in Table 6, the significant two-tailed probabilities of satisfaction with mentors' ideological leadership, research guidance, practical guidance, academic development planning, career development planning, attitude toward academic governance and organizational management among graduate students of different genders are 0.04, 0.04, 0.01, 0.03, 0.02, 0.01, 0.02, which are less than 0.05, indicating that there are significant differences in satisfaction with mentors' ideological leadership, research guidance, practical guidance, academic development planning, career development planning, attitude toward academic governance and organizational management among graduate students of different genders. There are

significant differences in the satisfaction of supervisors' leadership, research guidance, practical guidance, academic development planning, career development planning, attitude toward academic governance and organizational management. There is no significant difference in moral guidance and mentoring relationship.

Table 6 Results of the test for differences in satisfaction with mentoring among graduate students of different genders

Gender		Means	P
Thinking and Leading	Male	4.37	0.04
	Female	4.60	
Scientific Research Guidance	Male	3.95	0.04
	Female	4.31	
Practical guidance	Male	3.99	0.01
	Female	4.34	
Academic Development Planning	Male	3.85	0.03
	Female	4.20	
Career Development Planning	Male	3.83	0.02
	Female	4.24	
Academic attitude	Male	4.28	0.01
	Female	4.57	
Organizational Management	Male	4.05	0.02
	Female	4.43	

3.3.1.2. Type of Master

As shown in Table 7, the two-tailed probabilities of satisfaction with academic development planning, attitude to learning, and organizational management were 0.02, 0.03, and 0.02 respectively, which were less than 0.05. This indicates that there were significant differences between the different types of master's students in terms of satisfaction with academic development planning, attitude to learning, and organizational management. Moreover, the mean value shows that academic postgraduates are more satisfied with the guidance of their supervisors than professional postgraduates.

Table 7 Results of the test for differences in satisfaction with mentorship among postgraduate students in different master's categories

Type of Master		Number of cases	Means	P
Academic Development Planning	Academic	199	4.28	0.02
	Professional	379	4.08	
Academic attitude	Academic	199	4.60	0.03
	Professional	379	4.49	
Organizational Management	Academic	199	4.47	0.02
	Professional	379	4.33	

3.3.1.3. Grade Level

As shown in Table 8, the two-tailed probability of significance is 0.04 less than 0.05, indicating that there is a significant difference in the satisfaction of research supervision among postgraduates of different years, and it shows that the mean score of the second year of research is the lowest and the third year of research is the highest.

Table 8 Results of the test for differences in satisfaction with mentorship among postgraduate students of different years

	Grade Level	Number of cases	Means	P
Scientific Research Guidance	Grade1	329	4.26	0.04
	Grade2	150	4.14	
	Grade3	99	4.44	

3.3.2 Analysis of factors influencing mentorship satisfaction

In order to explore the influence of master's degree students on the satisfaction of mentoring, the evaluation indexes affecting the satisfaction of mentoring of graduate students were finally established through literature research and expert consultation combined with research data, and structural equation modeling was used to analyze the factors influencing the overall satisfaction of the mentoring status quo with four dimensions of ideological education, academic guidance, development planning and humanistic care as independent variables. With the help of AMOS 24.0, a structural equation model diagram of mentoring satisfaction was constructed and the following hypotheses were put forward.H1: Civic education has a significant effect on mentoring satisfaction, i.e. mentors have a positive impact on postgraduate students through civic education.

H2: Academic mentoring has a significant impact on mentoring satisfaction, i.e. graduate student mentors can improve their mentoring satisfaction through academic mentoring.

H3: Developmental planning has a significant impact on supervisory satisfaction, i.e. postgraduate supervisors can improve their supervisory satisfaction through developmental planning guidance.

H4: The degree of humanistic care has a significant effect on the satisfaction of mentoring, i.e. the more the graduate student mentor pays attention to the humanistic care of the graduate student, the higher the satisfaction of the graduate student with the mentoring.

After constructing a structural equation model of tutor satisfaction using AMOS 24.0, the questionnaire data was imported and model calculations were carried out to check whether the structural equation model

matched. The fit indices of the model meet the fit criteria, indicating that the model fits well.

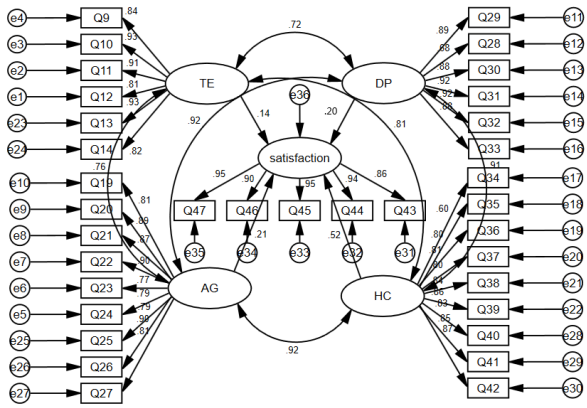

Figure 4 Structural equation model diagram

Table 9 Structural model fit

Fit index	Indicator Reference Standards	Statistical values	Compliance with adaptation standards
X2/df(CMIN/DF)	1<X2/df <3	1.626	Y
TLI	>0.9	0.981	Y
IFI	>0.9	0.983	Y
CFI	>0.9	0.983	Y
GFI	>0.9	0.957	Y
AGFI	>0.9	0.953	Y
RMSEA	<0.08	0.036	Y
SRMR	<0.08	0.057	Y

Then Maximum Likelihood was adopted to analyse the influencing factors of mentoring satisfaction. From the table, it can be seen that the standardized path coefficients of tutor's thinking and nurturing, academic guidance, development planning and humanistic care on tutor's guidance satisfaction are 0.140, 0.210, 0.200 and 0.520 respectively. It can be seen that humanistic care of postgraduate tutors is the primary factor influencing postgraduate students' satisfaction with tutor's guidance; followed by tutor's academic guidance, development planning guidance and tutor's thinking and nurturing The positive influence of mentoring on postgraduates. The p-values of H1, H2, H3 and H4 are all less than 0.05, indicating that the latent variables of the four selected dimensions have a significant positive influence on the satisfaction of postgraduate students with their tutors.

Table 10 Research hypothesis testing

Assumptions	Standardised path coefficients	S.E.	C.R	P
H1	0.140	0.063	2.569	***
H2	0.210	0.096	1.272	***
H3	0.230	0.144	4.418	***
H4	0.520	0.110	1.978	***

4. CONCLUSIONS

1. Postgraduate students should focus on enhancing their ideological and moral awareness.Through the analysis of the questionnaire, we found that more than 90% of the postgraduates are satisfied with the mentor's leadership in thinking and politics. In addition to the tutor's guidance, postgraduates should also make use of their spare time to pay attention to the country's development and to improve their ideological awareness spontaneously and independently, so that they can communicate with their tutors at a deeper level and understand the concepts and suggestions conveyed by them. The study of ideology is closely related to academic research, and in the course of daily study under the tutor, one can be influenced by the scientific and rigorous attitude of the tutor.

2. Postgraduates should be clear about their future development plans. The percentage of academic development advice given by tutors to postgraduates is 82%. At present, postgraduates are still in a passive role for their own future development planning, underestimating the role of academic planning and career planning in postgraduates' study career and not actively preparing for future development, some students think that they can graduate successfully if they achieve the usual grades and research tasks, and that further education and employment are irrelevant, and their understanding of self-development planning is becoming The percentage of satisfaction with the employment assistance provided by tutors is 10.3%, and there is excessive reliance on the help and guidance of tutors. Therefore, postgraduates should have a positive attitude and enterprising spirit in development planning, pay attention to overall personal development, have a higher level of knowledge, have a clear learning purpose, enhance the awareness of academic research, and at the same time be diligent in research, eager to enrich and improve themselves through various ways such as course study, research experiments and academic exchanges, and have a strong desire for knowledge and enterprising consciousness (Wang, 2019). Develop career planning, exercise career abilities, prepare for future employment, grasp employment opportunities strongly and make correct choices, continuously accumulate their own job-

seeking capital, enhance competitiveness, and lay a solid foundation for future career development.

3. Postgraduate students should take the initiative to interact with their supervisors. 62.3% of postgraduates have a high overall recognition of the humanistic care of their tutors, and students get along well with their tutors in a harmonious atmosphere, and express their recognition that postgraduates should actively communicate with their tutors so that they can better understand their physical and mental health problems, communicate in both directions to find out where the problems lie, work together to create a harmonious atmosphere, relieve the pressure of external factors, and face the pressure of employment and further studies together. In addition, postgraduates should maintain a rigorous attitude towards their studies, learn from their supervisors with an open mind, give full play to their own initiative, actively communicate with their supervisors and make their needs known to them in a timely manner in order to receive personalised and targeted help and guidance from them.

4. Deepen Civic Education and Establish Correct Values. According to the results of the analysis, there is a significant difference between the satisfaction of second year research students and first and third year research students. Mentors should strengthen the ideological education and consolidation of second-year students, intersperse richer ideological materials in the guidance and communication with postgraduates, and guide them in their outlook on life, values and worldview. The role of the supervisor as the primary person responsible for the ideological and political education of postgraduates should be given full play at this stage, and the correct concepts such as academic ethics and socialist core values should be conveyed to postgraduates (Hao, 2022). In China's higher education institutions, tutors have more contact and the closest relationship with postgraduates. While training postgraduates to complete their professional theoretical courses, tutors should provide guidance on postgraduates' ideological and moral education, daily behaviour and mental health. They should cultivate students' positive outlook and establish correct moral concepts, and intersperse ideological and political education contents appropriately in the classroom and academic discussions to lead students to practice the core socialist values.

5. Strengthen humanistic and emotional care.Humanistic care (0.520) is the most influential factor in tutor satisfaction. Female tutors are more satisfied with humanistic care for postgraduate students than male tutors, and male tutors should strengthen humanistic care and communicate deeply with students for better academic research. Teachers should get closer to students, reach out to students, and communicate more with them. More generous and sincere love, giving more attention, expectation, care and love to students. In addition to academic guidance, supervisors should also pay attention to the cultivation of innovation and practical ability of postgraduates. In addition, the mentor's own quality will also have an impact on the postgraduate students, therefore, in life, the mentor should guide the postgraduate students to correctly deal with interpersonal relationship and other life issues, and enhance the ability to adapt to society.

FUND PROJECTS

Chongqing Postgraduate Research Innovation Project in 2022: " A study on the evaluation and improvement path of intelligent education literacy of primary and secondary school teachers in the era of artificial intelligence " (Project No.: CYS22571)；
Chongqing Postgraduate Research Innovation Project in 2022 " Research on the evaluation and cultivation path of postgraduate research literacy under the vision of artificial intelligence"(Project No.: CYS22575);

REFERENCES

[1] Top ten hot spots of postgraduate education in China in 2020. J. China Postgraduates,2021(01):2-9.

[2] Hao Yuanyuan. (2022). Leading the innovative development and quality improvement of postgraduate ideological and political education with the new development concept. J. Degree and Postgraduate Education, 2022(03):57-62.

[3] Hou Zhijun. (2017). Research on effective mentorship based on knowledge sharing. J. Fudan Education Forum,2017,15(01):47-53.

[4] Wang Xun. (2019). Exploration of career planning guidance model for postgraduates in the Internet environment--based on the perspective of career development stage theory. J. Journal of the University of Electronic Science and Technology (Social Science Edition), 21(03):81-84.