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How does participating scientific research projects affect postgraduates' academic aspiration and interest? Grounding theory research based on six universities in H province

Lun XIONG,¹ Hualing FANG,^{*2} Xingxing YAN,^{*3} Shuke FU,^{4,5} and Baoming FAN⁶

¹Department of Development Planning and Discipline Construction, Wuhan Institute of Technology, Wuhan, 430205, China

²Regional Higher Education Reform and Development Research Center, Wuhan Institute of Technology, Wuhan 430205, China. Corresponding Author.

³Department of Alumni Work and Cooperation Development, Wuhan Institute of Technology, Wuhan 430205, China. Corresponding Author.

⁴School of Law and Business, Wuhan Institute of Technology, Wuhan, 430205, China

⁵Center for High Quality Collaborative Development of Resources, Environment and Economy, Wuhan Institute of Technology, Wuhan, 430205, China

⁶Graduate School, Wuhan Institute of Technology, Wuhan, 430205, China

*Corresponding author. Email: 17031001@wit.edu.cn; yxxwit@126.com

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Abstract

Participation in scientific research projects is the main way of postgraduate training, and academic aspiration and interest is an important variable affecting the quality of postgraduate training. So, how does participating in scientific research projects affect the academic aspiration and interest of master students? By interviewing 28 master students from 6 universities in H Province and using the grounded theory research method, a path model of the impact of participating in scientific research projects on the academic aspiration and interest of master students is formed: taking personal characteristics as the initial condition, important others such as tutors and research group examples and scientific research environment as the support category, and the change of graduate students' psychological state as the intermediary, Graduate students will take active or passive action strategies in scientific research activities, which will enhance or reduce their academic aspiration and interest. The change of academic aspiration and interest will react on their psychological state, forming a virtuous circle or bad circle. The model has important enlightening significance for graduate education and management.

Keywords: academic aspiration and interest; postgraduates; research project

1. Introduction

In recent years, the enrollment of master's degree students in China has been on the rise, especially in 2020 when more than 900,000 master's degree students were enrolled nationwide, more than twice the number of 10 years ago. Against this backdrop, the quality of master's degree students' training has received more attention. The education administrative department has also issued relevant policies to improve the quality of postgraduate education. Among them, the "Opinions of the Academic Degrees Committee of the State Council and the Ministry of Education on Further Strengthening the Standardization of Degree and Postgraduate Education Quality Management" (hereinafter referred to as "Opinions") emphasizes that "we should adhere to the quality inspection and screening at key points such as qualification examinations, thesis proposal and mid-term assessments", and proposes to "improve and implement the graduate student streaming and withdrawal mechanism, and early stream and withdraw graduate students who are not suitable for continuing their studies according to the training plan". The "Opinions" have established a policy framework for guiding universities to focus on improving the quality of postgraduate education from both the training process and streaming mechanism.

Outside of the educational administration department, the academic community has also conducted numerous studies on improving the quality of graduate education. Related research shows that improving the quality of graduate education should focus on enhancing the "academic ability" of graduate students, and academic interest is one of the most "active" factors in enhancing their "academic ability".[1] Generally speaking, academic interest is considered as a general tendency of individuals' curiosity, intrinsic motivation, and enjoyment in pursuing work for intellectual stimulation and academic progress.[2] In this study, the academic interest of graduate students refers not only to their internally driven motivation to engage in academic research, but also to a psychological tendency to aspire for careers related to scientific research. One of the primary ways to cultivate graduate students is through research training. Generally speaking, participating in research projects is the main channel for conducting research training, and it is also an important research experience for graduate students. These research experiences can help them focus more on research activities, and the knowledge and experience gained can directly or indirectly increase their interest in research careers.[3] For doctoral students, research training is a crucial part of constructing their academic professional identity.[4] Related studies abroad also suggest that one of the benefits of students participating in scientific research is an increased interest in it.[5] Factors influencing graduate students' academic aspirations include individual academic motivation, research investment[6], mentor factors[7], environmental factors[8], and many other aspects. Through literature analysis, it has been found that participating in scientific research projects is an activity that integrates all these influencing factors. For master's students, who are considered the reserve force for scientific research, what specific factors affect their academic aspirations during their participation in research projects, how do these factors interact with each other, and how do they impact graduate students' academic

aspirations? Answering these questions can help us more comprehensively reveal the changes and influencing mechanisms of master’s students’ academic aspirations, thereby proposing policies to stimulate and enhance their academic aspirations.

2. Research Design

2.1 Research Methodology

This study adopts the Grounded Theory approach in qualitative research. Grounded theory is a research method for the systematic analysis of qualitative data and the construction of theory, proposed by Barney Glaser and Anselm Strauss in 1967[9].As a qualitative research method, its primary objective is to build theories based on empirical data. The basic idea is to generate theories from data, requiring researchers to maintain sensitivity to theories and flexibly utilize literature through continuous comparison and theoretical sampling, to rigorously evaluate the theories derived through the process.[10]

2.2 Research Subject

By combining convenience sampling and standard sampling, this study selected 28 master’s degree students from six universities in H province as interviewees. Among these 28 subjects, the interview data of 4 randomly selected subjects were used for subsequent theoretical saturation testing. The specific details of the interviewees are as follows:

Table 1 Basic Characteristics of Interviewees

Sample characteristics	Classification Criteria	Percentage
Type of School	Double First-class Universities	46.43%
	Non-Double First-class Universities	53.57%
Type of Master’s Degree	Academic Master’s Degree	60.71%
	Professional Master’s Degree	39.29%
Field of Study	Natural Sciences	75%
	Humanities and Social Sciences	25%
Grade Level	First-year Master’s Student	14.28%
	Second-year Master’s Student	46.43%
	Third-year Master’s Student	39.29%

2.3 Data Collection

The researchers compiled a semi-structured interview outline based on relevant literature and the research topic, primarily focusing on the following aspects: issues related to postgraduate students’ personal backgrounds include reasons for pursuing postgraduate studies, professional interests, academic foundation, willingness to pursue doctoral degrees, and expectations for scientific research before participating in projects; issues related to significant others include the interaction between postgraduate students, their mentors, and peers in scientific research activities; issues related to the research environment include research work conditions,

the atmosphere of the research group, the relationship between mentors and students, peer relationships, and the impact of significant events on academic work. Furthermore, based on the actual situation of the interviewees, the order of the interview content is not strictly associated with the order of the interview outline, and interviewees are allowed to provide supplementary explanations on related issues. Meanwhile, the researchers guided the interviewees to share more about their actual situations to objectively and comprehensively reflect their true thoughts. From July to September 2021, the researchers conducted in-depth interviews with 28 interviewees, lasting between 30 and 60 minutes each. To ensure the integrity and accuracy of the interviews, they recorded the interviews with the consent of the interviewees. After all interviews were completed, the original data was anonymized, and the audio recordings were fully transcribed into textual materials.

2.4 Analytical Tools

In this study, the computer-assisted qualitative analysis software NVivo11.0 was employed as the coding and analysis tool. NVivo11.0 is currently one of the most frequently used computer-assisted qualitative analysis software, capable of processing various data formats (such as text, audio, video, images, and graphics) and aiming to quantify qualitative data as much as possible.

3. Data Analysis and Model Construction

This study employed grounded theory and followed the corresponding operational procedures to conduct three-level coding on the textual materials obtained from interviews, namely, open coding, axial coding, and selective coding. Through these three-level coding processes, the phenomena were conceptualized, and the concepts were integrated into initial categories, further generating main categories and core categories. Based on the logical relationships between the categories, a model of influencing factors and pathways of academic interests among postgraduate students was formed. The specific data and analysis are as follows:

3.1 Open Coding

During open coding, researchers need to suspend presuppositions and select materials openly with theoretical sensitivity, dissecting, examining, comparing, conceptualizing, and categorizing the materials.[11]After "conceptualizing" the materials, open coding is formed. In this study, the textual materials of 24 research subjects were coded and labeled sentence by sentence, and then the original materials were gradually conceptualized and categorized based on this. Through repeated comparison, integration, and induction, this study extracted 74 concepts in total. Then, based on this, the overlapping initial concepts were further summarized and compressed into 13 initial categories, including professional interest, personal ability, motivation for scientific research, personal personality traits, mentors, academic role models, research atmosphere, interpersonal relationships, research work, reinforcement, self-efficacy, research mindset, and research activities (see Table 2).

Table 2 Open Coding Excerpt

Excerpts from Original Materials of Different Interviewees	Concept	Initial Categories
I became interested in my current direction in my junior year of college; I really like this major and I also want to learn more about it in depth; I can't say that I like it, but I don't hate it either; I used to be interested, but after learning more and doing more, I felt very boring	Interest in the field	professional interests
The main thing is to see if the type of scientific research project matches my interests and hobbies	alignment between the content of research work and professional interests	
I used to study computer science, but I encountered problems with mechanical control. It involves knowledge gaps, and there is no one to guide me now. I have no foundation in this field. I think my professional ability is OK, but the impact is great, because all our projects, whether they are scientific research projects or commercial projects, are based on our major	Professional Foundation	Professional Foundation
The software I used during my graduate studies was the same as the one I used for mathematical modeling in my undergraduate studies, so I got started quickly	Undergraduate Research Foundation	
I may have had a longing for scientific research when I was a child, and wanted to enter those research institutes and become a researcher or something like that. I want to change education, so I want to be a teacher. If I want to be a university teacher, I have to get a doctorate degree	Ideals and Goals	Research Motivation
One of my characteristics is that if people around me are studying and I am playing, I will feel anxious and not be able to play seriously. I either study with them or I am afraid of falling behind others	Anxiety in Comparison with Others	
Because of my personality, I am more introverted and conservative. I don't like to change majors casually and I like to do what I love. I don't like the task-oriented model. I like to do things on my own initiative, but I am not limited by those task-oriented models, such as regular reporting. I have never reported	Personality Traits	Individual Characteristics

3.2 Axial Coding

Axial coding involves the formation of categories, attributes, and dimensions (i.e., the positioning of attributes on a continuum, such as intensity or frequency), as well as the development and examination of the relationships between various categories, based on open coding.[12] In this study, by analyzing, comparing, and summarizing the various categories extracted from open coding, logical interrelationships between the categories were discovered. Based on these logical relationships, the categories were further classified,

ultimately resulting in five main categories (see Table 3).

Table 3 Axial Coding Consequence

Concept	Initial Category			Main category
	class	Attribute	Dimension	
Participation in scientific research during undergraduate education strengthened interests; alternative admission; interest in the major; the degree of matching between scientific research work content and personal interests.	Professional interest	Degree	High-low	Personal characters
Laying the foundation for undergraduate research; mastering research methods through undergraduate research; facing research pressure; difficulties in reading literature; challenges in writing papers; encountering difficulties in experiments; professional foundation; leading research independently; personal capabilities.	professional foundation	Degree	good-poor	
Desire to engage in technically demanding work; conducting research to solve practical problems; ideals and goals; self-improvement; needs for future development; desire to learn more knowledge; continuous development in the professional field; proving oneself; for graduation purposes.	research motivation	Degree	strong-weak	
Comparing oneself with others can lead to anxiety; refining one's own choices.	personality traits	promotion	yes-no	
Supervisor's management of students; supervisor's understanding of students; supervisor's approach to cultivating students; supervisor's busy status; supervisor's academic level; supervisor's personality cultivation; supervisor's provision of research directions; the interaction mode between supervisor and students; supervisor's support; supervisor's guidance; pressure from the supervisor.	Mentor Traits	guidance frequency	High-low	Important people
		guidance content	practical-ineffective	
		research pressure	large-small	
		academic level	High-low	
		degree of understanding students		
The Exemplary Role of Models: The Incentive of Other Classmates in the Laboratory	academic role models	assistance	large-small	
		motivation	large-small	
Research Group Atmosphere; Laboratory Management; Peer Support; Different Research Directions among Peers; Scientific Research Ethos in Schools; School Training Model; Comparison among Peers	research atmosphere	promotion	large-small	Research environment
The relationship between mentors and students, as well as the relationship among friends	interpersonal relationships	form	harmonious-tense	
Handling miscellaneous tasks; Recording experimental data; Designing experimental protocols; Conducting research surveys with mentors; Writing research reports; Writing final project papers; Applying for research grants; Heavy workload in scientific research; Research involving interdisciplinary knowledge; "Instrumental personnel"; "Scientific research laborers"	research work	quantity	much-moderate -little	
		depth	deep-shallow	
		difficulty	difficult-moderate -easy	
Scientific research achievements; Mentor's attitude towards students' research work; Research progress; Sense of achievement in scientific research		nature	positive-negative	Mental state
Determining whether to continue academic development in the future based on one's own abilities.	self-efficacy	intensity	High-low	
Encountering difficulties in scientific research; Poor research work performance; Feeling psychological pressure during scientific research; Having low mood in the laboratory; "Enjoyable research"; Enjoying the process of identifying errors when experiments fail	research mindset	type	pleasant-depressed	
Studying professional skills outside of class; Adjusting one's mindset and continuing despite experimental failures; Actively communicating with mentors; Participating in group meetings; Being passive or unmotivated in one's research work; Postponing one's research efforts.	research activities	behavior	active-passive	Scientific research activities

3.3 Selective Coding

Selective coding refers to the process of identifying a core category from the primary categories, with other categories serving as subsidiary categories. Then, through an integrating scheme or story line, various theoretical elements (categories, attributes, hypotheses) are integrated. [13] Through the analysis of five primary categories, we have identified "personal traits" as the initial condition, "research environment" and "significant others" as subsidiary categories, "psychological state" as the mediating condition, and "research activities" as the action strategy. All these five primary categories are related to the proposition of "the influence of participating in research projects on academic interests." Therefore, we make a flexible adjustment and consider this proposition, which is related to all the primary categories but outside of them, as the core category. To explore the logical relationship between the core category and other categories, we integrate them through an integrating scheme to construct a model of "the influence of participating in research projects on the academic interests of master's students" (see Figure 1).

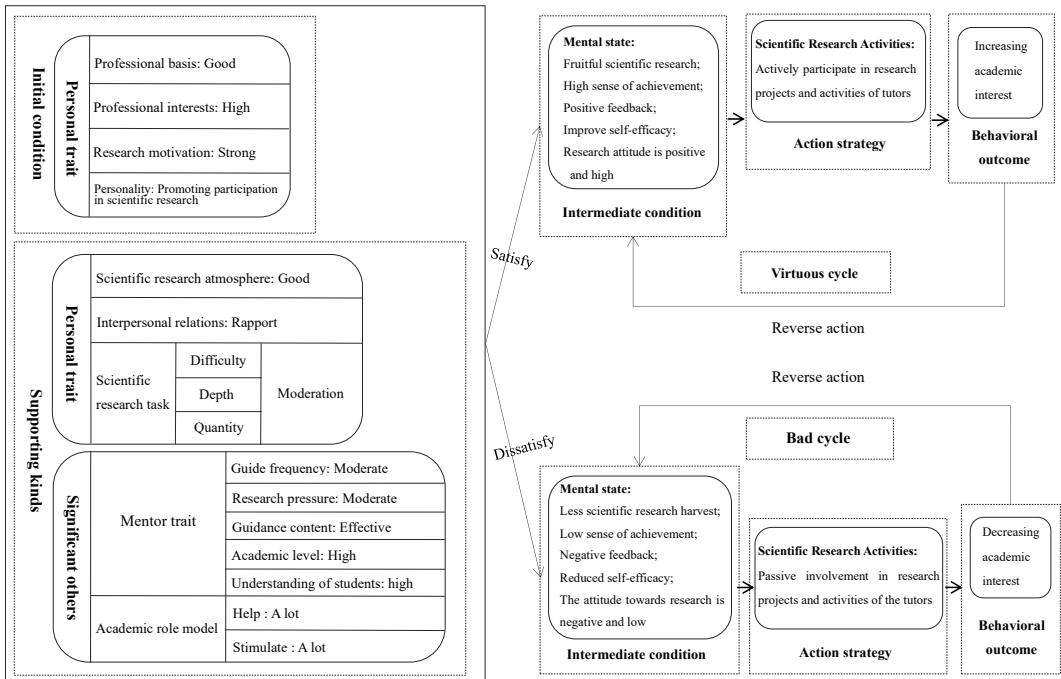


Figure 1. Path model of influence of research project participation on academic aspirations of master students

3.4 Theoretical Saturation Test

Theoretical saturation means that a newly added sample can no longer develop new concepts and categories, and cannot generate new theories. [14] After the model was established, the reserved interview data of 4 research subjects were coded and analyzed to test the theoretical saturation. It is found that there are no new concepts, categories and relationships, and the analysis results can still reflect the "influence of postgraduate students' participation in scientific research projects on their academic aspirations", indicating that the model has reached theoretical saturation.

4. Model Interpretation and Model Verification

In order to better clarify the logical relationship between the categories of the model, the categories in the model and their relationships are explained below, and the model is verified by relevant cases.

4.1 Model Interpretation

4.1.1 Personal traits as initial conditions

Personal characteristics mainly refer to the unique personality characteristics, professional foundation and interest, personal ability and motivation to engage in scientific research of each postgraduate student, which is the personal attribute characteristics of postgraduate students. This study finds that the enhancement or weakening of academic interest of postgraduate students first depends on their own personal characteristics, and their professional

foundation, interest and identification of their major, as well as personal characteristics are the initial conditions for the generation of academic interest. Whether personal traits are conducive to their participation in scientific research projects will have an impact on their subsequent psychological states and action strategies, and ultimately affect the generation, enhancement or weakening of their academic aspirations.

4.1.2 As an important person and research environment supporting the genus

The important persons referred to in this paper are mainly the academic role models of master's supervisors and research teams. This study found that even if the postgraduate students have personal characteristics suitable for scientific research, their academic aspirations are still influenced by their mentors and academic role models in the same research group. If mentors and role models can give correct and appropriate guidance to master students when they face academic difficulties, they can not only solve the problems they face, but also mobilize the enthusiasm and initiative of participating in scientific research projects, so that they can have a long-term development in the academic direction. Otherwise, it will have a negative effect. At the same time, as the guide of the students' scientific research road, the tutor's demonstration role and reasonable guidance can make the students get a positive learning experience and show a good learning attitude.

Scientific research environment is mainly the academic environment in the process of participating in scientific research projects, including the atmosphere of scientific research work, interpersonal relations, and work content. This study holds that, under the condition of similar personal characteristics, good scientific research atmosphere, harmonious interpersonal relationship and moderate scientific research tasks can help postgraduate students develop interest and enthusiasm in scientific research work and form a positive psychological state. However, bad scientific research atmosphere, tense interpersonal relationship, high-intensity and high-difficulty scientific research tasks will frustrate the enthusiasm and initiative of postgraduate students in scientific research work, resulting in negative psychological states.

4.1.3 Psychological state as a mediating condition

Psychological state refers to the psychological activities of postgraduate students in scientific research activities, based on personal characteristics, under the influence of important others and scientific research environment, and is a kind of intermediary condition. This study finds that under certain conditions of personal characteristics of postgraduate students, if important people such as tutors and research environment are conducive (unfavorable) to their participation in scientific research projects, their psychological state will change and be reflected in scientific research activities, thus affecting their academic aspirations. Specifically, if the tutor's guidance method is correct and effective, and there is the influence and help of the research group's example, and the research environment is good, the graduate students will gain a lot in scientific research, improve their sense of self-efficacy, and then form positive psychological feedback, prompting them to take a positive way to carry out scientific research activities. On the contrary, in the process of participating in scientific research projects, if the scientific research atmosphere is not good, the interpersonal relationship is tense,

the tutor gives too much pressure, and the scientific research harvest is small, resulting in frustration and even depression, the graduate students will take a passive way to carry out scientific research activities.

4.1.4 Research as an action strategy

In this study, scientific research activity refers to the behavior and attitude of postgraduate students when they participate in scientific research projects, and it is the action strategy of postgraduate students. From the above analysis, it can be seen that under the influence of personal characteristics, significant others and scientific research environment, master students will have different psychological states, and then more active or passive participation in scientific research projects, and promote the enhancement or weakening of academic aspirations of master students. To be specific, under the influence of tutors and classmates in the research group, the research environment of the research group is better, and the graduate students can obtain certain achievements in scientific research activities, improve their sense of self-efficacy, form positive psychological feedback, and motivate the graduate students to actively participate in scientific research activities, thus enhancing their own academic aspirations. On the contrary, if all or part of the above conditions cannot be met, psychological negative feedback will be formed, and the graduate students will passively participate in scientific research activities, thereby reducing their academic aspirations.

4.1.5 The reaction of academic interest as a result of behavior to psychological state

Academic interest is not only a kind of internal motivation, but also a kind of psychological tendency to engage in scientific research related work. This study found that academic aspirations can react on the psychological state of graduate students. Specifically, most of the master students who have formed high academic aspirations will have high morale and strong motivation, and this positive psychological state will be reflected in scientific research actions, which will further enhance their academic aspirations, thus entering the virtuous circle of "high academic aspirations - increasing the enthusiasm of scientific research - actively carrying out scientific research activities - higher academic aspirations". On the contrary, it will form a bad cycle of "low academic interest - reduce the enthusiasm of scientific research - passive scientific research activities - lower academic interest".

4.2 Model Verification

The following is to obtain the complete situation of the two cases through the interview, and verify the logical relationship between the various categories in the model.

4.2.1 Increased academic interest

Master B3, master majoring in Power Engineering and engineering Thermophysics, bachelor majoring in Energy and Power Engineering. When asked if he was interested in his current major, he said, "Very interested, my college major is completely my own choice, based on interest to choose," and later said, "I have done mathematical modeling twice in the undergraduate stage, one national competition and one X competition." "What I used in graduate school was the same software that I used in mathematical modeling." B3

has several reasons to pursue graduate studies. "First, I want to be a teacher, based on my dissatisfaction with education, I want to make a change, so I want to be a teacher. If I want to be a university teacher, I must get a doctor. Second, I actually worked for two years after graduating from college, because I was not satisfied with the nature of the job, I felt particularly mechanical and repetitive, worthless." B3 has strong scientific research momentum, and the academic level of the supervisor is also very high, "the supervisor has published 80 papers, 25 of which are SCI". When talking about his mentor's guidance to him, B3 said: "Regarding the question of direction setting, what kind of model you put forward in general, or what aspect you can do, I think this aspect is his strong point, he reads a lot of papers, and is sure of many frontier directions in this field, so he directly tells you what direction you can do." Since both the undergraduate and working stages of B3 focus on the direction of power generation and energy storage, the supervisor determines his current research direction based on his basic situation and scientific frontier, which is still in the direction of power generation and energy storage. The research group has a doctor, who he thinks is relatively excellent, "whether it is the solid degree of theoretical knowledge, programming ability, as well as the ability to draw and write papers are admirable". In B3's words, the atmosphere of the research group is "quite good, the pressure is not too great, but the tutors who give guidance will give guidance and help you". In this process, B3 has published one SCI paper and is now preparing to apply for doctoral study. He said, "My long-term goal is definitely not to graduate, but if I can read a doctorate, I want to read a doctorate, even if I have delayed my graduation, I have not been able to read a doctorate." Then I have no loss, so I will apply for an extension of graduation and do not write my graduation thesis at this stage. During this time, I must produce two SCI papers so that I can apply for this doctorate."

It can be seen from the interview records that B3 has a certain interest in the major, a good professional foundation, and a high motivation for scientific research. In addition, the supervisor has a high academic level, has a corresponding understanding of the students, and the guidance method is suitable and effective. In the same research group, excellent students are encouraged and guided by the example, the research atmosphere is strong, the interpersonal relationship is harmonious, and the difficulty of scientific research is moderate. B3 actively participated in scientific research projects, improved its scientific research ability, obtained satisfactory scientific research results, improved self-efficacy, and then more actively involved in scientific research activities, and produced the ambition to study for a doctoral degree, and enhanced academic aspirations.

4.2.2 *Weakening of academic interest*

Master A7, professional master, graduate major is materials and chemical engineering, undergraduate is materials chemistry, professional interest is general, when asked if he is interested in this major, he said, "OK, undergraduate is this major, follow the reading." The professional foundation is general, and then I said, "My theoretical knowledge is relatively small, and the undergraduate foundation is not good." Research motivation is for better work: "Reading is the best way to improve your salary, but also the least time", the tutor has a high academic level, is a direct professor, but now explore a new field with students, so the

effectiveness of the guidance content is not high, when asked how often the tutor guides the students, A7 answered: "Guidance? It's not accurate, because after my mentor came to this school, he did not want to do the previous direction, maybe more basic knowledge than us, more is to explore together, the weekly report will slightly correct the direction, he does not know much about this direction." A7 is the second year of the tutor's student, he said, "I took the senior brother's project to do, he has met the graduation requirements when he was a second year, but the tutor wants him to do a new one, he can not do it, already may be a little 'depression' (depression as understood by the interviewer, whether it is medical 'depression' unknown)." "Students who helped other teachers couldn't stand his intensity and style, and they all went back to their old mentors." The work intensity and pressure of the A7 laboratory is very large, "the tutor is there seven days a week, from 9 am to 12 PM" "We did not clock in, but he assigned us tasks that could not be completed, he will give you pressure, always chasing you, asking for experiment results, reporting every day, making a PPT, what did you do every day? What are the results of the experiment? What conclusions are drawn? If the experiment was done wrong, why?" "Although the teacher said verbally that he would rest early and take a day off on the weekend, he would call you at dinner and say that he wanted to see some experimental data, and that you were eating dinner and had to go." "Sometimes it is exaggerated, he gets off work, after 10 o'clock, he will ask you if you are in the lab, I say 'yes', he will come and guard you until 11:30." Because of the management style of the supervisor, when asked about the relationship with the supervisor, A7 answered: "Average, tense? A little nervous, generally nervous!" When asked if he would communicate with the teacher in private, A7 replied, "No, everyone will sigh when they see him." However, the relationship between the students in the research group is relatively good. When asked about the relationship between the research group, A7 said: "The relationship between our laboratory students is relatively good, because everyone has experienced hardships together, and the feelings are relatively deep." After A7, because of its high pressure situation, it temporarily shelved its scientific research and carried out a rest. "I was really depressed, seeing people without smiling faces, listless when I entered the laboratory, with a black face, and did not want to talk to others, a very bad state. After talking to the teacher, I unilaterally gave up." When asked if he had any idea of pursuing a doctorate, he said, "When I first entered the graduate school, I wanted to see if I could do it, but now I have no idea." And sighed. Asked what made him change this idea, he replied: "The teacher's influence is still relatively large, the time is too tight, there is not much space for their own play, or it may be that they just came in and did not adapt. Because they all said that the first year is mainly in class, and the time is relatively free, maybe our tutor has just arrived, and the professor is directly hired, the business pressure is relatively large, and the senior students are relatively few, and they will not let us go."

It can be seen from the interview records that when A7 participated in the scientific research project, the factors that had the greatest influence on his academic aspirations were his tutors and the scientific research environment, under the circumstance that his professional interest and professional foundation were general and his scientific research motivation was external. Under the pressure of tutors, the whole atmosphere of scientific research is rather depressed, the relationship between tutors is strained, the state of scientific research is not good, the scientific research ability is not improved, the professional interest

is not cultivated, the scientific research task is difficult, the self-efficacy is reduced, and the strategy of temporarily suspending scientific research is adopted, and the academic interest is weakened.

5. Conclusion, Discussion and Recommendations

5.1 Research Conclusions

Based on the above analysis, it is found that the influence of postgraduate students' participation in research projects on their academic aspirations is as follows: With personal characteristics as the initial condition, supported by important people such as mentors and research group models and research environment, and mediated by the change of graduate students' psychological state, graduate students will take active or passive action strategies in scientific research activities, which will enhance or reduce their academic aspirations, and the change of academic aspirations will react on their psychological state. Thus forming a virtuous cycle or a bad cycle.

Specifically, in the process of participating in scientific research projects, postgraduate students have different characteristics, that is, different professional interests, research ability, research motivation and personality characteristics. Meanwhile, the academic level of their tutors, how much they know about students, the frequency of guidance, the effectiveness and ineffectiveness of guidance content, and the pressure felt by students are also different. Similarly, the role model of the same research group promotes their research work, the degree of difficulty and quantity of research work perceived by the graduate students, the research atmosphere of the research group, and the form of interpersonal relationship are also different. The above will have an impact on the psychological state of postgraduate students. The amount of their scientific research output will produce positive or negative feedback on their behavior, and improve or reduce their self-efficacy. This series of psychological states will be used as intermediary conditions to encourage them to adopt active or passive strategies to carry out scientific research, and then enhance or reduce the academic aspirations of postgraduate students. When their academic interest is enhanced, it will react on their psychological state, further promote their active scientific research activities and continue to strengthen their academic interest, thus forming a virtuous cycle, on the contrary, it will form a negative cycle.

5.2 Discussion

Due to the limitations of research methods and data, it is impossible to analyze to what extent each initial category has an impact on the psychological state and scientific research actions of master students, and then affect their academic aspirations. And the mutual influence between the initial categories and the main categories is also difficult to fully present in the model. In the next step, the researchers will continue to explore the impact of participating in scientific research projects on the academic aspirations of master students through quantitative research methods, combined with quantitative models and survey data.

5.3 Policy Suggestions

5.3.1 Formulate admission standards and training programs to promote the differentiated development of different types of graduate students

The conclusion shows that the personal characteristics of postgraduate students are the basic factors affecting their academic aspirations. With strong scientific research interest, good scientific research foundation and certain scientific research motivation, postgraduate students can better promote the development of their academic aspirations. As there are certain differences between professional master's students and academic master's students in terms of professional foundation, professional interest and scientific research motivation, it is necessary to formulate different standards and programs for different types of graduate students in enrollment and training, so as to promote the differentiated development of different types of graduate students.

First of all, in the recruitment process, for academic masters, we should focus on whether they have the corresponding academic foundation and academic enthusiasm; For professional masters, more attention should be paid to candidates' practical ability and development potential. Secondly, in the training process, the training programs of different types of master students need to be more detailed. For employment-oriented professional masters, it is not necessary to criticize their academic ability with the requirement of cultivating academic talents, but to establish a set of detailed assessment standards to test the practical level of professional masters. Finally, it is necessary to encourage and guide tutors to carry out targeted guidance according to the characteristics of different types of master students.

5.3.2 Establish a teacher-student mutual evaluation mechanism to promote equal exchange of guidance

The conclusion of the study shows that the tutor, as an important person and a shaper of the scientific research environment, plays an important supporting role in the influence of graduate students' academic aspirations. In the interview, it is also found that whether the status of both sides is equal when communicating with students is an important factor. Equal and effective communication is a prerequisite for the mental health of master students and the smooth development of scientific research work, which directly or indirectly affects the academic aspirations of master students. Only by equal communication can we express freely, and tutors can have a deep understanding of students, teach students according to their aptitude, greatly reduce the contradiction of guidance, and then increase the academic aspirations of master students and improve the quality of master students' training. Therefore, the way tutors work will have an important impact on students' academic aspirations and even the quality of training.

To improve the working mode of tutors, it is necessary to build a teacher-student mutual evaluation mechanism. On the one hand, it gives the graduate students the right to evaluate their tutors. Through the way of postgraduate students to guide and manage the guidance behavior of tutors, students who are repeatedly rated low will take management measures such as recruitment restriction, suspension of recruitment and cancellation of tutor qualifications according to the situation. On the other hand, the supervisor should be given the relevant power to evaluate the graduate students. If the matching degree between teachers and students is low, the supervisor should be replaced or the teacher should be

withdrawn in time. Through the establishment of a sound teacher–student mutual evaluation mechanism and evaluation system, improve the adaptability of learning guidance, promote equal communication and common development of learning guidance.

5.3.3 Promote the "pass along" model to create a good atmosphere for scientific research

As a supporting condition, scientific research environment affects the academic interest and training quality of postgraduates. Research group atmosphere is an important sub–category of research environment, which has a crucial impact on research activities and attitudes of postgraduate students. The interview found that many master’s students would consult their peers in the same research group when they encountered professional problems. On the contrary, a research environment without peer communication will greatly reduce the academic aspirations of master students. If there are students in the same group with similar research directions, the "help and guide" mode is adopted. Even if there are difficulties in scientific research or less guidance from the supervisor, a good scientific research atmosphere can enable the whole research group to help each other, so as to promote the master students to actively carry out scientific research work.

5.3.4 Establish an early warning and intervention mechanism for adverse psychological states, and adopt flexible and diverse training methods

The research conclusion shows that the psychological state of graduate students as an intermediary condition directly affects their scientific research behavior and attitude. Therefore, for the graduate students with negative and low mental state or mental crisis, the early warning and intervention mechanism should be established. Colleges and universities should regularly evaluate the psychological state of postgraduate students according to their scientific research environment and activities, timely give early warning and intervention to students with poor psychological state, and make corresponding adjustments to the research direction, research environment and supervisors of postgraduate students according to their scientific research situation, so as to block the chain of transmission from bad psychological state to psychological crisis. Avoid forming a bad cycle mediated by mental state. In addition, colleges and universities should combine their own reality, move forward through quality inspection, and disperse the psychological crisis risk of master students in time and space dimensions. At the same time, flexible and diverse training modes are adopted to optimize degree evaluation methods, and different requirements are put forward for different types of master students in terms of scientific research achievements, so as to avoid the state of low self–efficacy of graduate students, improve their scientific research enthusiasm, academic aspirations and training quality.

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Author Biography

Lun Xiong, Male, born in Aug., 1978, Professor, Department of Development Planning and Discipline Construction, Wuhan Institute of Technology, Wuhan, China, <https://orcid.org/0000-0001-9549-3853>.

Hualiang Fang, Corresponding Author, Male, born in Oct., 1982, Associate professor, Regional Higher Education Reform and Development Research Center, Wuhan Institute of Technology, Wuhan, China, <https://orcid.org/0009-0001-1879-0616>, Address: No.206, Guanggu 1st road, Donghu New & High Technology Development Zone, Wuhan, Hubei Province ,P.R. China, Email: 17031001@wit.edu.cn.

Xingxing Yan, Corresponding Author, Male, born in Feb., 1988, Lecturer, Department of Alumni Work and Cooperation Development, Wuhan Institute of Technology, Wuhan, China, <https://orcid.org/0009-0004-6525-7314>, Address: No.206, Guanggu 1st road, Donghu New & High Technology Development Zone, Wuhan, Hubei Province ,P.R. China, Email: yxxwit@126.com.

Shuke Fu, Male, born in Jan., 1984, Professor, School of Law and Business, Wuhan Institute of Technology, Wuhan, China, <https://orcid.org/0000-0002-5484-4431> Baoming Fan, Male, born in Sep., 1990, Lecturer, Graduate School, Wuhan Institute of Technology, Wuhan, China, <https://orcid.org/0009-0006-5737-9586>.

Baoming Fan, Male, born in September 1990, Lecturer, Graduate School, Wuhan Institute of Technology, Wuhan, China, <https://orcid.org/0009-0006-5737-9586>.

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