Theoretical Physics and Quantum Mechanics, 2024, 1(1), 23-27
https://www.hillpublisher.com/Journals/tpqm/
ISSN Online:
ISSN Print:

Research on the Improvement of Postgraduate Scientific Research Innovation Ability Based on Field Theory—Taking Physics as an Example

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How to cite this paper: Xiaoyun Wang, Yinfei Shao, Yonggang Huang, Hong Yang, Peng Kong, Ke Deng. (2024). Research on the Improvement of Postgraduate Scientific Research Innovation Ability Based on Field Theory—Taking Physics as an Example. *Theoretical Physics and Quantum Mechanics*, 1(1), 23-27.
DOI: 10.26855/tpqm.2024.12.004

Received: October 29, 2024
Accepted: November 20, 2024
Published: December 11, 2024

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Abstract

At present, the craze of postgraduate entrance examination is sweeping the whole country. With the enrollment expansion of colleges and universities, the number of postgraduate students is increasing year by year. The training of postgraduate students is becoming one of the important ways for colleges and universities to ensure the output of high-quality talents. High or low innovative ability of graduate students of scientific research is to measure each college graduate reference of teaching and talent training effect. There is a huge development space of this article is based on the graduate student innovation ability of the background of the realistic possibility. From the perspective of "field" theory, physics graduate student, for example to analyze its present situation of scientific research innovation ability, and to explore and study the methods and approaches to efficiently improve the scientific research innovation ability of physics graduate students.

Keywords

Field theory; Graduate students; Scientific research and innovation ability; Physics

1. Introduction

"Field theory" proposed by Pierre Bourdieu is an important concept in sociology. This concept is mainly inspired by the concept of " field " in physics. He summarized the characteristics of the field as relational, regular and competitive. By analogy, the graduate education field is a place of social activities that connects different actors in the field with educational relationships as the bond and is jointly established according to the rules of action. At the same time, these actors also contribute their strength to protect or transform the structure of the field [1]. Therefore, the field is the carrier of the objective relationship between the actors. While the actors influence the field through their behavioral activities, they will also be affected by the field, and they will restrict and promote each other. As important actors in the graduate education field, graduate students have prominent problems such as uneven quality and low scientific research and innovation capabilities (slow scientific research progress and small number of scientific research results [2]). In physics, generally speaking, postgraduates who have participated in scientific research during their undergraduate studies can quickly enter the " scientific research state " in their future research [3]. In particular, under the influence of the current regulation that postgraduates are not required to publish academic papers to graduate, and can participate in graduation defense as long as they complete and pass the thesis [4], there is still a long way to go to greatly improve the scientific research and innovation capabilities and levels of postgraduates.

Note: The article was originally published in *Physical Science and Technical Research*, and this is an authorized translation of it.

2. Problem Tracing

2.1 Field Socialization—Interpersonal Relationships

A good teacher-student relationship is a booster for promoting scientific research output. After entering school in the first year, each graduate student can freely choose a supervisor to take on part of his or her guidance and teaching work. Due to the differences in everyone's lifestyle and problem-solving, if the teacher-student relationship is not handled properly, conflicts can easily arise. When guiding graduate students, supervisors usually give each graduate student a direction that they are good at for in-depth study. Some graduate students are hesitant when determining their research direction, and after a long time, they ask for a change of supervisor or direction, which brings great resistance to the teacher's work. Secondly, the study at the graduate stage is very different from the study at the undergraduate stage. If a graduate student does not actively try to solve a problem every time he or she encounters a problem but keeps asking the supervisor, the problem may be temporarily solved, but his or her ability has not been substantially improved, and it will leave a bad impression on the teacher. Too many times is not conducive to the construction of a harmonious teacher-student relationship.

2.2 Field Training—Management System

Supervisors play an important role in the training of graduate students, and the selection and assessment of supervisors is an important part of it. Some colleges and universities have relatively simple selection and assessment criteria for supervisors, and only measure whether a supervisor is qualified based on the number and quality of the supervisor's articles and the number of projects, ignoring the examination of the supervisor's moral level and psychological quality. This will not only lead to the supervisor's lower moral standards and requirements, but also be a disaster for graduate students. Some supervisors are not very concerned about the scientific research of graduate students, and let graduate students grow arbitrarily in a "free-range" state. Graduate students have been living with supervisors who have shortcomings in their thoughts and behaviors for a long time. "If you are close to vermilion, you will be red, and if you are close to ink, you will be black." If you are negative and lazy in thought and do not regulate yourself in action, you will not be able to conduct scientific research better.

2.3 Field Actors—Life Planning

Time is very precious for graduate students. Two to three years is neither short nor long. How to make good use of time is a required course for every graduate student. Graduate students who don't know how to grasp time often feel that they stay in the laboratory every day doing physical experiments or calculating physical formulas in the office. While witnessing the rapid progress of other students, they also witness their own stagnation. Time management performance. Many graduate students put all their energy into the "postgraduate entrance examination". Once admitted to the graduate school, they just muddle along. While others are reading foreign literature, they are "surfing" on the Internet. While others are doing sports and fitness, they are still addicted to the Internet. You can imagine that the gap will become more and more obvious day after day, not to mention the investment and progress in scientific research.

3. Improvement Strategies

3.1 Methods for Personal Improvement

3.1.1 Active self-adjustment

The essence of physical research is a long psychological battle, a struggle with oneself. Only by adjusting one's mentality can one be invincible and invincible. Scientific research shows that a certain degree of physical exercise has a promoting effect on people's physical and mental health and learning progress. Appropriate indoor or outdoor exercise during lunch and evening breaks can help release certain psychological pressure and build a strong physique, which can improve the scientific research and innovation ability of graduate students invisibly. In academic issues, if you encounter problems or difficulties that cannot be solved for a long time, you can seek help from classmates or teachers; in terms of mentality adjustment, you should express your depression and distress in time, maintain a good mental state and an unyielding mentality to actively deal with setbacks, and lay a solid foundation for improving your ability level.

3.1.2 Reasonable planning

Reasonable planning of one's time and future, and setting a realistic goal for oneself can help graduate students clarify their direction and enhance their fighting spirit. In terms of time management, the four quadrants of time management can be used to improve one's time management ability. In terms of future planning, the author recommends that graduate students can make detailed plans for each academic year. In the first academic year, in addition to completing professional courses, they should read 1-2 articles every week and write a literature review every month to achieve a thorough understanding; in the second academic year, they can determine the topic of their graduation thesis, apply for projects, and gradually start writing papers; in the third academic year, they should determine their graduation plan. If they choose to work, they should write their graduation thesis as soon as possible, search for suitable positions through multiple channels to submit their resumes, and comprehensively consider factors such as the geographical location of employment, salary and benefits, and choose the most desired position; if they hope to continue their studies, they must clarify the necessary conditions for doctoral studies to make themselves more competitive and stand out.

3.1.3 Practical research

In terms of the cultivation of basic academic innovation capabilities for graduate students, basic capabilities such as grasping academic trends, evaluating academic history, designing research frameworks, defining research content, and academic expression can all be effectively cultivated and improved through scientific research project practice [5]. In project practice, graduate students should read a large amount of literature to grasp the basic direction, understand the basic research ideas and research process, master professional terms and academic terms, give play to the role of " practice is the only criterion for testing truth ", and deepen their understanding of scientific research innovation.

3.2 Teacher Assistance Method

3.2.1 Patient guidance

Teachers carry the glorious mission of teaching and educating people, and play an indelible role. It is common for graduate students to encounter difficult problems in the process of scientific research. Teachers should not ignore them or tell them everything. They should select representative problems, adopt an inspiring teaching method, patiently guide graduate students to find their mistakes and try to solve them step by step. They can provide academic guidance, life or future planning guidance, graduation and employment guidance to graduate students within their own capabilities [6]. They should seek common development from the five aspects of clarifying the direction, analyzing problems, cultivating rationality, improving skills, and intensive research [7], and be a teacher with both moral integrity and talent that is worthy of graduate students' trust.

3.2.2 Comprehensive investigation

In the education of graduate students, we should pay attention to not neglecting one while focusing on the other. Teachers should comprehensively consider each graduate student and treat each graduate student equally. Teachers are like Bole, with a long-term vision, seeing the potential development possibilities of graduate students, not "only grades" or "only results", and affirming the excellence of each graduate student, while tactfully pointing out the shortcomings of each graduate student and the direction of future efforts. The quality assessment should include courses, scientific research and practical ability. This quality assessment covers the students' theoretical foundation level, problem discovery and problem-solving ability, and can be carried out through daily communication, group meeting reports, literature writing and other aspects. After accurately grasping each graduate student, we can teach students in accordance with their aptitude and choose appropriate ways to improve the scientific research and innovation ability of graduate students. For example, for diligent and hard-working graduate students, we can adopt a "soft" policy and give them guidance at the right time; for naughty and lazy graduate students, we can use both soft and hard methods, task-driven, improve their sense of urgency, give full play to the scientific research and innovation ability of graduate students, and let students learn and achieve something.

3.3 Ways to Improve School Quality

3.3.1 Improve management model

In order to improve the graduate management model, the school can follow certain principles and bases to formulate a list of graduate education management for the school and college. In the process of formulation, relevant governance entities need to participate in discussions and consultations, try to achieve the completeness and operability of the list of rights and management, clarify the responsibilities and work content of the colleges and universities, and achieve a win-win result of improving the comprehensive quality of graduate students while improving the management level. In terms of teacher management, the school should accurately grasp the new situation and new problems in the construction of the university teacher team, strengthen the professional skills training of teachers, actively build a platform for teacher development, strengthen the construction of first-class grassroots teaching and research offices, and build a school and college-level teacher training system with "school as the leader and college as the main body". Institutionalize and standardize the management of schools, colleges, teachers, and students, so that schools and colleges can give full play to their functional guarantees and teachers and graduate students can fully display their academic innovation capabilities.

3.3.2 Optimizing the mentor system

Schools can establish a dynamic personnel management model with the "graduate student tutor responsibility system" as the core, and at the same time cooperate with a complete tutor selection system, incentive evaluation mechanism, and graduate student academic exchange method to give appropriate material rewards and honorary titles to tutors with excellent evaluations, establish physics discipline leaders and role models among tutors, enhance tutors' sense of responsibility and self-optimization, strengthen the connection between tutors and colleges and graduate students, purify the unhealthy tendencies in academic research, gradually form a research-oriented research-based teaching model and a dynamic teaching and research team with high professional quality, promote communication and exchanges between tutors, and produce a "self-driven" effect.

3.3.3 Increase support

Schools should pay attention to investment in postgraduate scientific research and innovation, especially efforts to increase investment in equipment funding, supporting courses, and academic cooperation. Strengthen laboratory management, gradually increase investment in equipment and scientific research funds, and meet the basic needs of postgraduate research; use the latest scientific research results as textbooks, use classroom simulations of results as teaching content, and appropriately set up relevant and applicable software courses; increase the number of schools, universities, and research institutes The institute's cooperation efforts meet the needs of graduate students for scientific research and innovation through the rental of experimental equipment, the sharing of experimental data and the co-authoring of papers, and try to remove obstacles on the road to scientific research and innovation ; through various online and offline modes, Through lectures, symposiums, reports and other forms, experts in the field of physics can share research progress, successful experience sharing and research method guidance, broaden graduate students' access to information, and spark ideas for scientific research innovation.

4. Conclusion

As an important actor in the graduate education field, physics graduate students must have high scientific research and innovation capabilities due to the subject characteristics of physics, so that they can have a lot of ideas on the road of scientific research, give strong realistic possibilities to their fantastic ideas, let scientific research continue to go deeper and more practical, and let the development of academic research indirectly promote the development of social productivity, and promote the improvement of national scientific and technological strength and cultural soft power. Therefore, improving the scientific research and innovation capabilities of graduate students is not only an important humanities topic, but also an important social topic. In the face of the current situation that the scientific research and innovation capabilities of graduate students in China are not outstanding enough, in addition to the need for graduate students to give full play to their own subjective initiative, actively self-regulate, make reasonable plans and conduct practical discussions, teachers should also guide graduate students in a timely manner, so that each graduate student can fly in the same sky with the most beautiful posture. The school should continuously improve the management system, optimize the configuration of the tutor team, actively implement the "double tutor" system, and increase support for graduate students' scientific research and innovation as much as possible. Combined with the joint efforts of all parties, graduate students will surely be able to embark on their own path of scientific research and innovation, and demonstrate the unique style of graduate students in the new era.

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