

Research on Strategies for Improving the Scientific Research Ability of Teachers in Vocational Colleges

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Abstract: *In the construction process of vocational colleges, teachers' scientific research ability plays a positive role as a prerequisite for enhancing the comprehensive competitiveness of the college. At present, there is a general lack of scientific research awareness among vocational teachers in China; Lack of service in the development of scientific research work; There are issues such as weak scientific research foundation, insufficient innovation ability, and lack of collaboration in the construction of scientific research teams. In order to effectively improve the scientific research ability of vocational teachers and enhance the scientific research level of vocational colleges, by analyzing the influencing factors of vocational teachers' scientific research ability, the education regulatory department and vocational colleges should raise their awareness of the importance of scientific research work; Refine top-level design and improve management systems; Deepen the integration of industry and education, and build an innovation platform; By coordinating resources integration and establishing research incentive mechanisms between government and school, we continuously adjust the structure and strengthen functions to achieve high-quality development of vocational education in China.*

Keywords: *Vocational teachers; Scientific research ability; Improvement strategy*

1. Introduction

Vocational education, as a type of education, is an important component of higher education in China, responsible for educational teaching, scientific research, social services, and talent cultivation. In recent years, in order to further promote the high-quality development of vocational education, China has formulated a series of policy measures in top-level design, pointing out the direction for the healthy development of vocational education. In January 2019, the State Council issued the "Implementation Plan for National Vocational Education Reform", which clearly designated vocational education in China as a type of education, with equal importance to ordinary higher education. In March of the same year, the Ministry of Education and the Ministry of Finance jointly issued the "Opinions on the Implementation of the Plan for the Construction of High Level Vocational Schools and Majors with Chinese Characteristics", proposing that the core task of the "dual high" construction is to create a highland for the cultivation of technical and skilled talents and a platform for technical and skilled innovation services, further clarifying that scientific research is also an important function of vocational colleges.

In October 2021, the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council issued the "Opinions on Promoting the High Quality Development of Modern Vocational Education", encouraging Chinese vocational colleges to strengthen cooperation with international high-level vocational education institutions and organizations, carry out academic research, standard development, and personnel exchange. In order to continue promoting the high-quality development of vocational education and comprehensively improve the scientific quality and skill level of workers, in May 2022, the newly revised and implemented "Vocational Education Law of the People's Republic of China" once again proposed that the country encourages and supports scientific and technological research in vocational education, and promotes the co construction and sharing of vocational education resources across regions, industries, and departments. From the various laws, regulations, and policy documents issued at the national level, it can be seen that under the guidance of the "Double High Plan", scientific research has become an important function of vocational colleges in China's journey to achieve high-quality development of vocational education. Improving the scientific research ability of vocational teachers, building research platforms, and creating a strong academic atmosphere are important tasks for vocational colleges to achieve connotative development, It is also an important channel for cultivating qualified technical and skilled talents for society and promoting local economic and industrial development. For a long time, due to the insufficient emphasis

on scientific research work and low requirements for scientific research assessment in vocational colleges, teachers have insufficient motivation to engage in scientific research work, and their scientific research abilities still need to be further improved. For the majority of vocational colleges, how to enhance teachers' scientific research awareness, continuously improve their scientific research level, promote the transformation and application of scientific and technological achievements, and better serve the quality of talent cultivation is an important lesson that vocational colleges will face in the future.

2. The Significance of Improving the Scientific Research Ability of Teachers in Vocational Colleges

The scientific research work of vocational college teachers is the core link and major breakthrough in promoting the "double high construction" in vocational colleges. Scientific research services are an important function of vocational colleges. Vocational colleges should actively connect with the needs of regional economic development, innovate the model of scientific research services for society, and improve their contribution to economic and social development. At the same time, the scientific research ability of vocational college teachers is of great significance in the development process of vocational colleges. In order to improve educational and teaching services, teachers can improve their educational and teaching level, enrich teaching content, innovate teaching methods, and form a development trend of "promoting teaching through scientific research, and stimulating research through teaching" through scientific research work; Teachers' scientific research serves the quality education of students, and teachers guide students to actively participate in scientific research and cultivate students' professional ethics and innovation and entrepreneurship ability. Teachers' scientific research serves the regional economic development, and higher vocational colleges rely on their own industry characteristics and talent advantages to carry out technical services, technical consultation, technical training and production and processing for enterprises and industries. Therefore, it is of great significance to comprehensively enhance the scientific research ability of vocational college teachers by taking the opportunity to meet the various requirements of social service capacity construction in the "Double High Plan".^[1]

3. The Current Situation of Scientific Research Work for Teachers in Vocational Colleges

With the continuous improvement of vocational education status, vocational colleges have also made significant improvements in the construction of teaching staff and research platforms, and the number of related research achievements is also increasing year by year. However, due to the constraints of traditional concepts and research conditions, there is still a significant gap between Chinese vocational college teachers and ordinary undergraduate college teachers in terms of research concepts, professional qualities, methods and practices. At the institutional level, there are still significant cognitive misunderstandings in the management mode, evaluation standards, value orientation, and achievement transformation of scientific research work in vocational colleges. The existence of the above various problems seriously hinders the improvement of the innovation ability and scientific research level of vocational teachers, and is also a practical problem that urgently needs to be solved to achieve the "Double High Plan".

3.1. Weak scientific research awareness among vocational teachers

Since 2019, we have been vigorously promoting the "Double High Plan" in vocational education, creating a highland for cultivating technical and skilled talents and a platform for technological and innovative services. This is both an opportunity and a challenge for vocational schools and teachers. On the one hand, vocational teachers have low scientific research quality and limited abilities, and most of them do not believe that they have the ability to engage in deeper scientific research work; On the other hand, due to the numerous teaching tasks carried out every day and the heavy workload, many vocational teachers have a very weak scientific research awareness, which reacts on materials and has subjective initiative. Due to the lack of scientific research awareness among vocational teachers, it is difficult to promote the development of scientific research work in vocational schools. The issue of weak scientific research awareness among vocational school teachers is not only a major obstacle to the development of scientific research in vocational schools, but also a major obstacle to the development of scientific research in vocational schools in China. To promote the development of scientific research in vocational schools, it is of great significance to study the issue of weak scientific research awareness among vocational school teachers.^[2]

3.2. Lack of service in the development of scientific research work

An important task of social services in vocational colleges is to serve the regional economy and enterprise development, providing intellectual support and talent protection for them. Therefore, the demand for regional economic development and enterprise technological innovation is the driving force for the forward development of scientific research work. That is to say, the development of scientific research can provide intellectual support for regional economic development, as well as technological innovation and guidance for enterprise production. The faster the development of regional economy and enterprises, the higher the requirements for the scientific research ability of vocational college teachers, which puts forward higher requirements for the scientific research ability of vocational college teachers. However, due to the fact that most teachers in vocational colleges directly enter the college to teach after graduation, without practical work experience in enterprises, the research results are disconnected from social needs and the actual situation of enterprises, reducing the service of research results and to some extent, causing waste of research resources.

3.3. Weak scientific research foundation and insufficient innovation ability

Most vocational colleges in China are upgraded from secondary vocational schools, so vocational teachers can be roughly divided into two categories. The first type is derived from the transformation of vocational school teachers. Most of these teachers have outstanding teaching abilities and fruitful teaching results, but due to a long-term lack of sustained scientific research work training, insufficient scientific research thinking and methods, they are unable to form a stable professional research direction. The second type is young teachers recruited from ordinary university graduates after the school upgrade. These teachers have relatively high educational qualifications, agile thinking, and strong scientific research abilities. However, due to their background in ordinary higher education and lack of practical experience, their understanding of vocational education is not in place, making it difficult to accurately grasp the development direction of vocational education. Therefore, in terms of scientific research achievements, most cases are to cope with the school's professional title evaluation or performance evaluation, resulting in low innovation level of scientific research achievements and difficulty in closely integrating theoretical research with production practice, forming duplicate low-level scientific research achievements.

3.4. Lack of collaboration in the construction of scientific research teams

The level of scientific research team construction in vocational colleges seriously affects the development of scientific research work in vocational colleges. In other words, the construction of scientific research teams provides talent support and technical support for the development of scientific research work, and is a prerequisite for ensuring the sustainable development of scientific research work in vocational colleges. Only a good research team can cultivate highly capable researchers, complete high-level research projects, and achieve the high goal of "dual high" construction. Higher vocational colleges are limited by their own educational conditions and teachers' research capabilities, making it difficult for them to undertake large-scale scientific research projects. In addition, the impact of professional title evaluation and recruitment standards has led to the phenomenon of teachers in higher vocational colleges competing independently in scientific research work. The emergence of this phenomenon greatly weakens the teamwork spirit of teachers in vocational colleges, hinders the development of scientific research work in vocational colleges, and affects the sustainable development of vocational colleges. Therefore, vocational colleges should establish high-level research teams, strengthen the cultivation of team awareness and collaborative spirit, and effectively achieve the collaborative function of research teams.

4. Analysis of Factors Influencing the Development of Scientific Research Ability of Teachers in Vocational Colleges

4.1. Teacher's scientific research awareness and positioning

Most vocational college teachers lack enthusiasm for scientific research and engage in scientific research only for the purpose of professional title evaluation. In addition, the scientific research positioning of vocational colleges is different from that of undergraduate universities. Vocational college scientific research focuses more on applied research, mainly on technology development and achievement promotion. However, many vocational college teachers have unclear understanding of this positioning.

4.2. Teacher's energy investment

The current funding of public and private vocational colleges in China is linked to the number of students enrolled. From the perspective of input-output, vocational colleges are struggling to compete for students while being cautious in controlling the number of teachers. As a result, the student teacher ratio is unbalanced and the teaching tasks of teachers are heavy. According to statistics, the weekly workload of young and middle-aged teachers in vocational colleges is mostly over 16 class hours, and they also undertake teaching tasks for multiple courses and heavy non teaching tasks. Teachers usually focus their main energy on preparing lessons, writing lesson plans, correcting homework, guiding students in skill competitions, dealing with various inspections, and other tasks assigned by leaders. Their investment in scientific research is extremely limited.^[3]

4.3. School management mechanism

Most vocational colleges in China have been upgraded from their original vocational schools or adult education foundations, and their research management mechanisms are not mature, which to some extent limits the enthusiasm of teachers in scientific research.

4.4. Fundamentals of Scientific Research Platform

As an important carrier and support for scientific research, university research platforms are playing an increasingly important role in cultivating university research teams and outputting research results. At present, undergraduate universities have platforms such as national laboratories (engineering centers) and provincial and ministerial level key laboratories (engineering centers) as their support, while most vocational colleges have a relatively small number of research platforms at a lower level. At the same time, there is still a significant gap in the number of scientific research instruments, venues, funding and other basic research conditions in vocational colleges.

4.5. Research atmosphere and team

In China, the current funding of vocational colleges is closely linked to the number of students enrolled and the employment situation, leading to most vocational colleges focusing on teaching, thereby weakening the weak research atmosphere. The existing teachers in vocational colleges have insufficient scientific research experience, and the new teachers are mostly from academic master's and doctoral programs, which cannot adapt to the characteristics of applied research in vocational colleges, resulting in a lack of leading scientific research talents and difficulty in forming a stable and close research team.

5. The Path to Enhance the Scientific Research Ability of Teachers in Vocational Colleges

5.1. Enhancing the Awareness of Vocational College Teachers on the Importance of Scientific Research Work

The development of scientific research work is one of the effective ways to improve the teaching level of teachers in vocational colleges. Teaching and research complement each other, and teachers can further improve their teaching level while actively carrying out research work. In the process of conducting scientific research work, teachers will face many new problems and be exposed to a lot of new knowledge, which is conducive to updating teaching content, enhancing students' interest in learning, and overall improving teaching level. The main tasks of vocational college teachers are to impart theoretical knowledge, improve students' quality, and cultivate their practical abilities. However, in order to better complete teaching tasks, teachers must continuously conduct scientific research, academic research, and technological research and development discussions in order to improve their knowledge level and teaching ability.

5.2. Refine top-level design and improve management systems

In the new era, the improvement of the overall scientific research level of vocational teachers requires a scientifically sound scientific research management system and mechanism to ensure it. Firstly, the education regulatory authorities and vocational colleges should comprehensively refine the top-level design, formulate and improve relevant scientific research assessment and management systems, standardize the procedures and standards for project application, research development,

technology transfer, and achievement registration, and improve the scientific research supervision and management system in accordance with the relevant requirements of the "Twenty Articles of Vocational Education" and the "Double High Plan", so that teachers can follow rules and regulations when engaging in scientific research work. Secondly, higher vocational colleges should further improve the scientific research evaluation management system, set up scientific and reasonable evaluation standards for scientific research achievements, and reasonably incorporate teachers' scientific research achievements into professional title evaluation, job promotion, performance appraisal and personnel adjustment and other related work, which points out the direction for the career planning and career development of teachers. Thirdly, higher vocational colleges improve the reward and punishment system for teachers' scientific research achievements, establish a reward and punishment system within the school that is mainly rewarded and supplemented by punishment, especially for scientific research achievements with high market application value, and guide higher vocational teachers to devote themselves to research and strive for excellence, which can stimulate the enthusiasm, initiative and creativity of the majority of higher vocational teachers to engage in scientific research and create a higher level of scientific research achievements.

5.3. Deepen the integration of industry and education, and build an innovation platform

Vocational teachers should not engage in scientific research work without the support of industry enterprises. They must adhere to the principle of integrating theory with practice, and carry out theoretical innovation and technological research and development through close cooperation with enterprises. Therefore, vocational colleges should focus on the specific practice of scientific research work, under the guidance of the "Double High Plan" goal, continue to deepen the integration of industry and education, guide teachers to deepen industry and enterprise cooperation, and widely carry out school enterprise cooperation. By building a research and innovation platform for school enterprise cooperation, we will further streamline cooperation channels, encourage teachers to conduct technical exchanges and on-the-job internships in enterprises, understand the latest development trends in related industries, master new production and manufacturing processes in industry enterprises, understand new management models in enterprises, and broaden our thinking for the smooth development of teacher research work. In addition, through in-depth cooperation between schools and enterprises, vocational colleges can make reasonable use of enterprise resources, jointly build product technology research and development centers, collaborative innovation centers, engineering technology centers, or internship and training bases with enterprises, raise funds reasonably, increase the investment and utilization rate of relevant scientific research and innovation platforms, improve the scientific research work environment, cooperate closely with enterprise technical personnel, and expand social channels for technology transfer and achievement transfer, Effectively improving the scientific research ability of vocational teachers and the social service ability of the school.^[4]

5.4. Collaboration between government and school for resource integration

The government is an important initiator, participant, and main driving force for technological innovation. The government integrates various resources such as social industry enterprises, university research institutes, and social capital through policy guidance and overall planning, achieving complementary advantages and deep cooperation, solving the problems of human, material, and material resources, and jointly promoting the improvement of scientific and technological innovation level. Collaboration with the government can help solve various problems in research topics, funding, platforms, personnel, and other aspects in vocational colleges.

5.4.1. Establish a communication and coordination mechanism

At present, the communication between the government and universities is usually limited to government departments conducting research in universities, and universities consulting and handling specific issues with government agencies. There is no regular communication and coordination mechanism between the two. The establishment of a communication and coordination mechanism between universities and the government requires both parties to reach a consensus on each other's needs on the basis of sufficient communication, establish a certain organizational form, and equip specialized personnel with specific responsibilities. The establishment of a coordination mechanism is extremely necessary for universities to deeply understand policies, obtain research topics, financial support, etc.

5.4.2. Building a technology research and development platform

The development of scientific and technological work and the improvement of teachers' technological level cannot be separated from the support of various platforms. Universities actively strive for government policy support, cooperate closely with regional local governments and industry

enterprises, and build vocational colleges into technology research and development centers and training centers for industry enterprises, forming a virtuous cooperation between politics, administration, schools, and enterprises.

5.4.3. Forming a flexible flow mechanism for human resources

Vocational colleges utilize government policy support to flexibly introduce technology leading talents and enterprise visiting professors, and quickly establish high-level research teams. On campus teachers can actively participate and undertake specific scientific research tasks, thereby rapidly improving their research capabilities. The existing teachers in vocational colleges can participate in major scientific research projects in universities and research institutes, improve their theoretical level of scientific research, learn basic scientific research skills, and accumulate scientific research experience by pursuing degrees, on-the-job further education, and visiting scholars.

5.5. Establish a research incentive mechanism

Vocational colleges should increase the investment ratio of scientific research funds, and provide corresponding supporting investment for different application project levels. At the same time, teachers should be encouraged to implement "school enterprise joint research", take active and effective reward measures, and provide good research conditions for researchers according to the proportion of projects. At the same time, strengthen the career development planning of the research talent team, and strive to provide institutional guarantees for the career development of research personnel. The current dominant research incentive method is the research paper reward system, and for vocational colleges, the reward standards should not be too high. Excessive demands on vocational teachers to publish academic papers in core journals before granting achievement rewards will undermine teachers' enthusiasm for scientific research. In addition, it is necessary to create a relaxed and harmonious research environment, so that teachers feel the sense of mission and responsibility of this profession. A scientific and reasonable incentive mechanism for job performance evaluation is a necessary condition for constructing reasonable compensation. For vocational colleges, improving the performance evaluation system with key indicators as the core content can help stimulate teachers' research enthusiasm. In today's society, the connotation of salary is no longer just money, but also includes inherent meanings such as respect, fair competition, and professional self-identity. Only by establishing a competitive performance incentive mechanism can universities have and maintain high-quality and high-performance talents in the long term. The performance incentive mechanism is reflected in the allocation, which should break the original boundaries of positions and levels. Schools should determine the job performance evaluation system based on the size of responsibilities, abilities, educational requirements, and work intensity of each position. Higher vocational colleges implement post performance wages, thus highlighting the importance of scientific research and breaking the phenomenon of seniority and distribution in schools.

6. Conclusions

Due to the constraints of traditional concepts and various historical conditions, the weak scientific research ability of vocational teachers and the weak scientific research atmosphere in schools have become key factors hindering the connotative development of vocational education in China. Currently, China is vigorously developing vocational education and comprehensively promoting the construction of "double high". Education regulatory departments, vocational colleges, and the majority of vocational teachers should recognize the development direction of vocational education and establish correct scientific research values. Vocational teachers actively engage in scientific research while conscientiously fulfilling their responsibilities in education, teaching, and talent cultivation. They continuously improve their scientific literacy and research level through continuous learning, accumulation, and innovation, making greater contributions to the high-quality development of vocational education in China.

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