

A Study Based on Niche Theory for the Development and Improvement of Vocational Teachers' Scientific Research Ability

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ABSTRACT

For the problem of the space for the existence and development of teachers' scientific research ability of vocational colleges is constantly compressed, lacking its due foothold, and is unable to provide sufficient impetus for teachers' professional growth and scientific research work. In this paper, the teachers' scientific research ability based on niche theory has been studied, including investigating the teachers' scientific research ability as an independent niche individual in vocational colleges research system, and reflecting on the current problems of teachers' scientific research ability, then analyzing and organizing the fundamental causes of vocational teachers, and finally exploring the effective path of training and improving teachers' scientific research ability in vocational colleges. As a result, we not only realize the evolution of group cooperation, team cooperation, and individual cooperation, but also strengthen academic exchanges, and optimize the ecological environment of scientific research.

Keywords: *Niche theory, Vocational teachers, Scientific research ability.*

1. INTRODUCTION

The main body of vocational college scientific research is teachers. Their scientific research ability not only determines the level of college innovation ability, but also plays a pivotal role in the national innovation system[1]. To build the innovative system combining scientific research with college education which puts higher requirements for colleges and vocational teachers, the improvement of vocational college teachers' scientific research ability is not only benefit for the personal development of teachers, but also an important strategic task for the development of vocational colleges[2]. Scientific research ability is also an important part of vocational teachers' professional ability and advanced improvement. The essence of scientific research work in vocational colleges lies in the foundation that vocational teachers exert their professional ability to do work on the basis of the benign interaction with other scientific research factors[3]. At present, science and technology growing rapidly, and the knowledge and technology updating greatly. If a teacher does not understand the development trend of science and technology, lacking sensitivity and exploration interesting towards the

frontier trends, and losing his own teaching characteristics and advantages, thus it is difficult to cultivate students with innovative ability. Teachers have to devote themselves to scientific research activities in their own professional fields, constantly encourage themselves to improve their professional knowledge structure, enhance their professional skills, and promote their teaching efficiency, so as to realize their own value in the classroom and practice venue, and provide an effective platform for their own professional development[4].

2. THE CONCEPT OF NICHE THEORY

The similarities between social systems and natural ecosystems make more people choose to use the basic principles and methods of ecosystems to interpret complex human social systems, in this context, the education ecology is born[5]. Since 1976, Cremin Lawrence, dean of Columbia normal college, proposed the concept of educational ecology in his Public Education, the methodology of natural ecosystem has begun to become a new perspective to investigate education system, and the basic principles and laws of ecology were used to reanalyze the structure,

environment and function of ecology, and to summarize the basic principles and laws of educational ecology[6].

2.1. The Definition of Niche

Niche mainly refers to the living state of organisms, the state in which organisms survive and develop in a certain natural environment, including the physiological characteristics and habits of organisms. In brief, ecology refers to the living state of all living organisms, and the interlocking relationships among them and between it and the environment. Every species cannot be independent of nature, interacting with other creatures inevitably all the time. It is precisely because of such relationship among organisms that every creature in every subsystem has its unique position and function, making it exist in the system and become the irreplaceable one, which determines its niche in the whole system. Niche also refers to the status, function and environmental characterization of such species determined by the species attributes based on the interaction with environment during their survival and development, and different species occupy different niche in the same region. Meanwhile, species will actively adjust their function and status in the process of environmental adaptation. It is this active adaptability that constantly contributes to the evolution of species to occupy more space for survival and development.

2.2. The Role of Niche

The identification role of niche on biological species is an important basis for species to distinguish with each other in the same ecosystem and the premise for their survival and development. Each specie has its own unique niche to distinguish it from other species. While occupying an ecological niche, shown through the features of foraging habits, feeding intention and characteristics of daily activities that different from other biological individuals in the same ecosystem. At the same time, the structural serialization function of niche in the objective ecosystem mainly refers to the correct relationship among organisms, including competition or coexistence in the ecosystem depending on their own development needs. And in the complex relationship in the ecosystem, to find their own correct position in the whole ecosystem, to promote the orderly operation of the whole system according to the inherent rules. The location, characterization and function of the biological species embodied in the niche have clearly defined the object, way and relationship nature associated in the survival and development of biological species. Therefore, the niche also determines the status and ranks of biological species on the nutritional chain in the ecosystem, so that it meets its own and systematic development needs in the corresponding position in the ecosystem.

3. ANALYSIS OF SCIENTIFIC RESEARCH ABILITY OF VOCATIONAL TEACHERS BASED ON NICHE THOERAY

3.1. Analysis of Longitudinal State of Vocational Teachers

The vertical state of vocational teachers' scientific research ability, that is, the current state presented by teachers by giving full play to their own conditions and accumulating teaching experience in practice. The problems are mainly lie in the analysis of teachers' scientific research ability from the scientific research chain of teachers. As the core element of the scientific research chain, teachers' scientific research ability must exist and play a role based on the premise of the integrity of scientific research ecological chain. The scientific research chain includes vocational teachers with basic scientific research ability, concentrating on scientific research activities within their capability, forming scientific research achievements, and the whole process of its promotion and utilization under the conditions of time and energy permit and the satisfaction of available resources including funds, equipment, support policies etc. It is the scientific research ability of vocational teachers to continuously realize its spiral development in such repeated practice. Therefore, if each link on the ecological chain cannot be successfully undertaken smoothly due to the lack of corresponding conditions and abilities, it will directly or indirectly react to the scientific research effect, and affect the growth of teachers' scientific research ability in vocational colleges. At present, in terms of the management of scientific research, a large number of vocational colleges simply copy the mode of ordinary undergraduate colleges and universities, and do not form a management system suitable for their own scientific research and development according to the running rules of vocational colleges.

3.2. Weak Practice Ability and Lack of Confidence in Scientific Research

3.2.1. Lacking Learning Ability and Insufficient Development Momentum

Teachers' scientific research ability is an effective combination of learning ability, practical ability and innovation ability in scientific research. The optimal structure of the three factors largely determines the scientific research ability of vocational teachers. Where the learning ability can provide an inexhaustible impetus for the improvement of vocational teachers' scientific research ability. That is to say, the vocational teachers with the learning ability can constantly make progress in their professional field. However, it dose not pay attention to the learning ability of vocational teachers, manifesting in little subscriptions to professional journals, few attention to professional frontier dynamics

and temporary data search, leading to form shortcut and fragmentation information and lack of independent and systematic learning.

3.2.2. Lacking Learning Ability and Insufficient Development Momentum

Some teachers lack the confidence and conditions in scientific research, assuming that the teaching task is heavy, they lack of time and energy and are incapable of scientific research and innovation. At present, there are still many deficiencies in the scientific research team. The cascade scientific research team has not been fully formed. It does not give full play to the collective wisdom of the members. There is the phenomenon of a few people work and others just list their names, which greatly destroys the enthusiasm of teachers to participate in scientific research. In addition, the serious lack of scientific research funds and the old scientific research equipment make the difficult and long cycle scientific research work more neglected.

3.2.3. Lack of Innovation Ability in Scientific Research and Assimilation of Ecological Characteristics

The uniform presentation of the achievements of scientific research activities in vocational colleges has formed the wrong orientation of plagiarism. In the long run, the blindly imitation of ordinary undergraduate colleges in scientific research path and one-sided pursuit of the grade of scientific research projects, resulting in the high overlap of teachers' scientific research and the ecology of teachers' scientific research ability, which leads to the dilution of ecological characteristics of vocational teachers' scientific research ability, and finally loss of their own status and function. At the same time, the high overlap of the two niches also means that the competition for scientific and technological resources. In the final analysis, the above situation lies in the lack of innovation capability of vocational teachers in scientific research.

4. OPTIMIZATION STRATEGY OF IMPROVING SCIENTIFIC RESEARCH ABILITY OF VOCATIONAL TEACHERS BASED ON NICHE THEORY

4.1. Correct Positioning, Reduce and Prevent the High Overlap of Scientific Research Niche

Niche is the basis for the survival and development of species. There will be very fierce competition between two different species that occupy the same niche, and finally they can only save one. The closer the niche is, the closer the range of two species is, and the more competitive the two encounters is. Therefore, niche separation is the key to the coexistence of organisms, which is also the core and essence of the law

of competition exclusion. Only by clearly knowing their own population niche in the whole system and the individual niche in the group, combining with the advantages of their own niche, then they can maintain and seize the profitable niche. Vocational education connecting to economy most closely have to carry out its own teaching and scientific research centering on the transmission and renewal of technical knowledge. The attributes of technical knowledge itself require vocational education to closely combine theory with production practice, which essentially determines the practical value orientation of vocational college teachers and the engineering path of scientific research activities. It is necessary to deeply realize the development direction of vocational college scientific research, and pay more attention to the actual social dynamics, by the way of finding out problems in the front line of production and management practice, seeking breakthroughs from technological requirement, and excavating the power of horizontal projects by combining multiple interests, as a result to constantly enhance teachers' scientific research ability in the technology promotion and innovation both on-campus and off-campus.

4.2. Enhance the Scientific Research and Innovation Ability and Realize the Dislocation Competition of Scientific Research Niche

Under the fierce competition law of material selection and the survival of the fittest, while the disadvantaged species do not die out, but freely live and reproduce along with the species in a strong position. It can be seen that even in the nature of the jungle, species do not all exist because of the strength, but for their species attributes especially in the world. Even the weak species can seek living space through their special niche, make full and effective use of resources, and realize their own continuation. Therefore, in order to survive and develop in the fierce competitive field of scientific research, the vocational teachers have to enhance their innovation ability of scientific research, highlight their own characteristic, and compete with other teachers of different education types and levels of scientific research ability through the directional expansion of niche position. Therefore, it necessary to combined with the type characteristics of vocational education to develop their own innovation ability of scientific research and establish the technology-oriented research as the dominant work.

It needs to make full use of their own advantages and resources, combining with the science and technology innovation center, product development center and technology promotion center of local economic construction, then actively carry out social technology services and production practice, effectively communicate vocational teacher' teaching and scientific

research with the actual production of enterprises, and try to apply for more joint research and horizontal projects with the enterprises by the way of cooperation in science and technology projects. In the face of broad scientific research space and opportunities, vocational teachers should find their own position in scientific research activities according to their own professional background, professional ability level and scientific research advantages. And they should never blindly pursue the lofty in the form of scientific research activities, and should strive to do the scientific research tasks within their ability, and to find a unique niche suitable for their own survival and development in scientific research practice, and make use of dislocation advantages to achieve surprise results.

4.3. Collaborative Evolution Strategy of Scientific Research Ability of Vocational Teachers

The niche system is the result of the development of different niche and their mutual relationships. Any independent niche in the system should prove and reflect its own niche by connecting with other niches all the time. Although the competition of resources based on survival and development in the system is very common, the key to the long-term and stable coexistence of different species in the system is the mutual cooperation and dependence, and competition is only the means, while the co-evolution is the purpose. Just because of this, the relative uniqueness, composition diversity and development stability of the species in the system are guaranteed, so as to realize the mutual coexistence and co-evolution among different species. Although the scientific research ability of vocational college teachers in the scientific research ecosystem is an independent unit, it also needs to interact with other individuals in the system, and properly handle with the relationship between competition and cooperation, realizing their own spiral development in the relatively stable and collaborative evolution system via coordinated symbiosis. Therefore, the development of teachers' scientific research ability of vocational colleges have to shift from competition to cooperation.

5. CONCLUSION

Starting from the characteristics of niche of scientific research ability in vocational colleges, in this paper, firstly, we properly utilize differentiation strategy, and clearly illuminate the concept, then highlight advantages in practice, prevent and reduce the high overlap of scientific research niche to achieve the differentiation competition of scientific research niche by conducting dislocation competition. Secondly, we take advantage of the ecological expansion strategy of vocational teachers' scientific research ability, and make full use of scientific and technological resources both

on-campus and off-campus, then expand the niche capacity of scientific research, and strengthen the construction of characteristics to expand or change the ecological position of scientific research. Finally, we make use of the collaborative evolution strategy of vocational teachers' scientific research ability, promote the research cooperation between enterprise and college, including inter-school cooperation, consequently, it not only realize the evolution of group cooperation, team cooperation, and individual cooperation, but also strengthen academic exchanges, and optimize the ecological environment of scientific research.

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