Study on Scientific Research Positioning of Higher Vocational Colleges Based on Functional Analysis

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Abstract. Controversies and misunderstandings have always been the focus about whether scientific researches should be conducted and how to conduct in higher vocational colleges. However, it is unquestionable for higher vocational colleges to conduct scientific researches, whereas the pivotal point is to pinpoint the exact position of scientific researches. This paper attempts to analyze overall development and feature construction with a view to exploring scientific researches’ status in higher vocational colleges by delving into functions and connotations based on functional analysis of higher vocational colleges.

Introduction

Higher vocational education is a type of education generated by economic development requirement, which has now become an indispensable component of national education as well as an important way to improve the overall quality of national work forces. In a broad sense, higher vocational education is a type of higher education so that it not only entails the function of higher education, but also embodies the nature of vocational education and training. As an entity to bear the function of higher vocational education, higher vocational colleges are to gain more developing room by means of expanding their educational functions while in the meantime a series of problems come to light, such as lack of features, low social recognition, low-level students’ quality, identity disorientation of graduates, low employment rate and so on, all of which are triggered by inaccurate positioning of higher vocational education. Positive and sustainable development of higher vocational colleges can be maintained only on the basis of accurate positioning. Accurate and reasonable orientation is the premise for colleges to plan and allocate resources, which plays a leading role in their development.

Inaccurate positioning and lack of self-characteristics of higher vocational colleges are attributed to the following reasons: on one hand, it is still at the stage of improvement because of immature self-development of higher vocational education; on the other hand, it is caused by insufficient and incomplete cognition of higher vocational education. In order to pinpoint the status of higher vocational colleges, we should commence with studying the functions of higher vocational education and move on to deep analysis and comprehension of higher vocational education connotations. Scientific research is one of the three functions of higher vocational education. The function of higher vocational education determines the overall development of colleges, and in turn, overall development also influences the scientific research status at higher vocational colleges.

Functions and Connotations of Higher Vocational Education

As the name suggests, "education" in higher vocational education includes two aspects: one is "higher"; the other is "professional". Higher education refers to the specialized education based on secondary education, and both higher vocational education and higher education share the nature of higher education. "Vocational" is the characteristic of higher vocational education. It is more profession-oriented than ordinary higher education with its activities geared towards specific social and occupational posts. Higher and professional are combined together both in terms of content and inferences, which are reflected through higher vocational education functions.
National Higher Education Laws in China stipulates three major functions of higher education, that is, personnel training, scientific research and social services. Higher vocational education is a part of higher education, and naturally it also undertakes these three functions[1].

**Personnel Training**

Talent training is the core function of all institutions of higher learning, which should be the serving center of the rest. "Stipulations on Comprehensively Improving Educational and Teaching Quality of Higher Vocational Education by The Education Ministry ([2006]16)" pointed out: "As an archetype of higher education, higher vocational education shoulders the responsibility of cultivating high skilled talents for first-line production, construction, service and management in China. It plays an irreplaceable role in promoting the process of socialist modernization."

It demonstrates personnel training status of higher vocational colleges. Personnel training is a systemic project where college teachers carry out teaching, training and a series of related activities, through which teachers impart knowledge, skills to achieve talent nurturing, reflecting the essence of higher education.

Higher vocational education embodies higher and professional functions. Firstly, qualified personnel trained in higher vocational education need to master high-level and systematic professional knowledge and theory with high command of practical capability of analyzing and solving real problems. Secondly, higher vocational education cultivates highly-skilled personnel geared toward first-line production, construction, service and management. Highly skilled talents are mainly divided into the following types: knowledge-skills type, technical-skills type and comprehensive-skills type. Although they are trained for the production line, but not as simple operators, rather than as candidates for posts requesting more technical skillsets that qualify them in return to be effective problem-solvers at higher level at key points. Thirdly, higher vocational education is to train talents who can provide technical guidance and managerial skills in the process of production practice. They should be good at communication, and information handling and using. At the same time, higher vocational talents also need high-level thinking ability and thinking mode, which are the manifestation of high-level humanistic quality.

**Scientific Research**

Scientific development and social progress have endowed higher education with a second function - scientific research. Scientific research refers to surveys, experiments, trials and series of activities that are being conducted in order to know intrinsic nature and motion patterns of materialistic world by usage of scientific methods and equipment so as to provide a theoretical basis for the invention of new products and development of new technology. According to the difference of purpose, task and research method, scientific research is generally classified as three types: basic research, applied research and scientific and technological development. There is no debate on whether higher vocational colleges should carry out scientific research or not, for it is also a function of higher vocational colleges, the embodiment of the nature of higher vocational education. The key point lies in its direction and position. Scientific research in higher vocational colleges should first focus on its purpose to serve personnel training. The goal of higher vocational colleges is to cultivate high-level technical talents, so scientific research should be based on applied research and technology development research, should let students participate in research projects, should cultivate students to practice for the production line to solve technical problems in production. Scientific research in higher vocational colleges should be based on local economic and social development. Most of the vocational colleges in China are local-based and most of their technical innovation inspirations and resources stem from thoughts about local development. Scientific research direction should be determined by local economic construction coupled with strategic policies of social progress in order to facilitate self-growth in the service of local economy[2].

**Social Service**

In the early twentieth Century, Wisconsin State University in the USA incorporated the ideology of serving the society into its running, which symbolized the formation of society-serving function
of institutions of higher learning. The society-serving function of higher learning institutions can be understood from two layers. Broadly speaking, teaching, scientific research and other various work in higher institutions all have the feature of society-serving, whose purpose is to cultivate talents, develop and spread knowledge. All of these are socially valued in that talents eventually will becomes the subject of social services to better understand and transform the world. In a narrow sense, social functions of higher institutions emphasize that direct social service should be contributed by universities, which means that universities should utilize their own knowledge, talents and technological advantages to solve production and social problems urgently facing enterprises and society. It also means that universities should exert more impact on the condition of satisfying self-need in terms of knowledge, talents and resources. What we usually discuss refers to social service in a narrow sense[3].

The function of social service in higher vocational colleges is more practical and professional, which reflects the interrelation among the three functions of higher vocational colleges. Talent training is the central task of higher vocational colleges, and the other two tasks should be carried out on the basis of first. Higher vocational colleges should cultivate high-level skilled personnel geared toward production line in each industry. Therefore, the scientific research in higher vocational colleges is mainly centered around technological application and technological development. Scientific research is conducive to better understanding of professional theories and knowledge, improvement of staff members’ professional traits, enhancement of educational quality, elevation of talent cultivation; on the other hand, it is the result of social development needs, which falls into the category of social service functions. Social services of higher vocational colleges are mainly to solve technical problems for industries and enterprises, to carry out horizontal cooperation and technological development, to accept entrustment to undertake some projects regarding local economy and policy study, as is complementary to scientific research inside higher vocational colleges. Social service in higher vocational colleges is beneficial to strengthening contact with the outside world, attracting all-around social investment to provide internships or practice opportunities for students so as to improve running and scientific research conditions, enabling higher vocational colleges to better understand the trend of social and economic development in order to promote reform and readjustment of education and research direction which will inevitably push forward improvement of personnel cultivation and scientific researches.

Analysis of Overall Development of High Vocational Colleges

With the popularization of higher education in our country, higher vocational colleges are confronted with opportunities and competitions, and special attention must be paid to pondering over development orientation and characteristic construction. Specifically, it is to solve the problem of "what kind of school to build" and "how to build a good school"; however, its essence is to study how to put into full play and deal with the three major functions scientifically and effectively and smoothly.

Positioning is a strategic problem in higher vocational colleges while feature establishment is a tactical problem of development. The former provides strategic guidance for the latter whereas the latter is the specific implementation of the former. The conceptual positioning is the premise of characteristic construction, and the target orientation is the foundation of characteristic construction, and the practical positioning guarantees fulfillment of feature establishment. Higher vocational colleges should try their best to exert their own advantages, realize characteristic construction and accomplish the goal of existence and advancement via competition on the basis of proper positioning.

Conformity to Rules Accuracy in Positioning

The positioning of higher vocational colleges should be viewed from three aspects: idea, objective and practice.

The macro level positioning should follow the law of educational development and it should be the direction of the school’s value pursuit. Higher vocational education has entered the stage of
connotative construction, which should be markedly distinguished from ordinary higher education. We must change our mind from thinking of higher vocational education as inferior because higher vocational education is nothing but a type of higher education. The only difference between those two is that in their personnel cultivation. Higher vocational education is committed to cultivating highly skilled personnel facing first-line production, construction, service and management. Higher vocational colleges should specify clearly this position and steer firmly the direction of talent training. Higher vocational colleges should clarify the mission of serving the society, make clear the concept of coordinated development with local and regional economic society, and put into consideration the three functions at the level of serving regional development. We are to train highly skilled personnel for regional economic development to carry out applied and innovative researches according to local industrial needs, and to provide critical technical services for enterprises[4].

The middle-level target positioning should comply with social development laws based on school’s realistic resources. As local colleges, vocational colleges assume the mission of serving the local districts, which implies that schools need to integrate self-growth closely with local development to build a unique, scientific and reasonable education system comprising three modules, namely, three functions as talent cultivation, scientific research and social service. We should investigate deeply into development features of local economy and society to set up majors in accordance with development demand to train personnel right for local economy. Energy limited, teachers should narrow down the research domain with specific aims like problems arising from development and conduct applied and technological development researches. We should guide students into regional industries to provide technical services for enterprises, and to help them solve problems occurring in production. We should properly handle the positioning and interrelations of the three major functions. For higher vocational colleges, talent training is the core function, and other functions should be implemented around this core. Scientific researches and technical services should weave around issues resulting from local development and school progress. Meanwhile, scientific researches can promote teaching while students’ participation in social services can also harness their practical abilities, hence improving the quality of personnel training.

Micro-level practice positioning ought to abide by market rules based on micro-positioning from the perspective of survival and development, which should facilitate the scientific and rational execution of school’s ideas and objectives. On one hand, we need to step outside campus for market survey to identify our position that is survival related, employment directed, and market oriented according to regional social features and industrial development needs, therefore, setting up concrete majors, course curriculum and modes of talent training. In addition, we need to work jointly with enterprises to cultivate talents, which means that after theoretical learning on campus, students practice internships and practical trainings in corresponding enterprises, then, after proper assessment, two parties concerned will sign formal employment contract to further their hiring relation. On the other hand, it is imperative for us to figure out characteristic construction positioning in a connotative development oriented fashion, conduct in-depth study of regional development and current condition supported by self-advantages to exploit resources for characteristic construction. Moreover, we also need to make direct contact with industry to set up special majors fit for local economy and nurture students for regional markets short of labor forces. It is our job to deepen curriculum reform, to establish specially-designed curriculum system, to train highly skilled personnel for enterprises[5].

Maximizing Advantages Nurturing Uniqueness

Characteristic construction must occupy a significant position if higher vocational colleges hope to secure winning in the fierce competition. Colleges characteristics are defined as a unique fine image superior to other schools characterized by long-term accumulation of school cultures and traits. Higher vocational colleges should face up to their own advantages and disadvantages, combine their own advantages with regional development needs to explore more characteristic majors. That is to map out talent nurturing modes and systems specially designed for highly skilled personnel, extend courses all the way to post objectives, highlight occupational capabilities,
demonstrate industrial demand, offer chances for students to truly master skillsets needed in real work posts, and genuinely satisfy regional needs for specific talents. Characteristic majors should be set up, featuring “close cooperation between colleges and enterprises, advanced training mode, excellent conditions for running schools, well-advantageous employment status”, to keep constant personnel input in process while teachers can provide technological services related to profession for the enterprises to achieve a win-win situation both for colleges and for companies. Teachers can start from unique majors to open up directions of scientific research, to discover research problems, to put forth realistic problems up to the theoretical level, to carry out scientific researches and to solve practical problems in industrial development. To sum up, higher vocational colleges have fulfilled its three major functions in characteristic construction.

**Analysis of Scientific Research Positioning in Higher Vocational Colleges**

After making clear the functions and overall development of higher vocational colleges, it is time to consider scientific research positioning in higher vocational colleges. It is definite and necessary for higher vocational colleges to carry out scientific research. As mentioned above, scientific research is one of the functions of higher vocational colleges. In order to fulfill this function, higher vocational colleges must carry out scientific research. At the same time, scientific research will promote the other two functions. Education and teaching research is an important direction and content of scientific researches in higher vocational colleges, which conforms to the rules and reality of higher vocational education. Colleges ought to ferret out problems, conduct scientific researches, solve problems, push ahead teaching reforms, and promote the improvement of personnel training quality according to the actual situation of personnel training and teaching. Another direction of scientific researches in higher vocational colleges is the R&D of applied technology. Based on local economic development needs and combined with local industrial characteristics, colleges are required to move forward with technological development, to materialize research findings in manufacturing, to enhance servicing ability of higher vocational colleges.

The key point of scientific research positioning in higher vocational colleges is to fathom out the purpose of scientific research, what kind of scientific research should be carried out and what kind of scientific research can be carried out, namely, the target positioning, type positioning and content positioning of scientific research.

**Scientific Goal Positioning**

Based on function and overall orientation, the research target positioning in higher vocational colleges mainly includes two aspects: first, we need to base ourselves at colleges in order to serve personnel training and educational teaching. Talent training is the first priority and core function of higher vocational colleges so that scientific research should be centering around and servicing it. Scientific research in Higher vocational colleges should concentrate on teaching practices, researches on how to bring up qualified highly-skilled personnel from the perspective of talent training objectives, which comes from school’s own need in development as the most direct way to transform scientific values. Second, colleges need to base them on local frontier servicing regional economic and social development. The regional characteristics of higher vocational education are decisive factors that create close bond between higher vocational colleges and the region. Higher vocational colleges should be based locally relying on local industry so as to carry out applied technology development, to solve practical problems in production and construction, to promote technological progress and production efficiency in enterprises, which is not only the responsibility of colleges, but also the proactive advantages and competitiveness of scientific researches in higher vocational colleges[6].

**Scientific Type Positioning**

As mentioned above, scientific research can be divided into three types: basic research, applied research and scientific and technological development research according to different purposes and
methods of the research, the value and significance of research findings. The three types of studies have different characteristics bearing different scientific missions. Basic research takes nature, society, humanistic phenomenon and substance movement as its research objects, in an attempt to excavate their essential connotations, to reveal their basic rules, and to obtain new knowledge and principles. Applied research is to put into practice or verification researching findings obtained from basic research in related fields, to determine possible usages of basic research results, or to research new methods that should be taken to achieve preset future targets. Scientific development study is to utilize research findings gained from applied research and current knowledge and skills to reinvent new technology, new methods and brand new products. This kind of research sets to solve practical problems, to produce new products or finish off engineering tasks.

Different types of institutions of higher learning engage in different types of scientific research with different emphases. For higher vocational colleges, the emphasis of scientific research should be placed on science and technology development as well as on education and teaching. In the meantime, certain kind of applied research can be done too. Higher vocational colleges are "teaching oriented" ones with main task set on teaching, and their scientific research focuses on practical application. Higher vocational colleges should proceed from reality, make moves with heed to their own strengths, make use of current school resources and talent advantages, combine school teaching with local situation, explore innovations and breakthroughs, and gradually improve the level of scientific research. Schools are requested to carry out researches concerning technological development and teaching, to pay attention to the practical application of research, to promote transformation of scientific and technological achievements aiming to solve production problems, and to apply educational and teaching results to guide teaching practice[7].

Scientific Content Positioning

According to the duty and mission of higher vocational colleges and the actual situation, the research contents there should concentrate on the following three aspects:

(1) Higher vocational education, teaching theories and patterns. In recent years, China's higher vocational education has witnessed both rapid development and series of problems surging from teaching practices. Educational research is the basic guarantee to promote scientific development of vocational education. Higher vocational colleges should follow the principles of “promoting teaching through scientific research” and “figuring out solutions in accordance with realistic situations”, meditate on and explore problems in education and teaching. We need to set goals of problem-solving based on colleges themselves from the angle of education and teaching practices to conduct school-based researches. The main contents include educational systems of modern occupational technology, mechanism and talent training modes of occupational technology education, majors and course systems study of occupation technical education, and quality standard research of occupation education.

(2) Development of Application Technology. Social service is a major function of higher vocational colleges, among which technical services is an important part of social services in those colleges, so it is necessary to carry out research and development of application technology. Based locally, higher vocational colleges should seize the advantage of running school in service of local economy and in cooperation with enterprises in talent cultivation, should strengthen exchanges and contacts with enterprises, should identify problems from production practices and solve them. With the goal of achievement transformation, technology development and product development, teachers should scavenge projects from production line to do applied technological development and researches.

(3) Local policies and mechanism. The social service function of higher vocational colleges is not only reflected in the cooperation with enterprises, but also in providing technical services for enterprises, and also in providing decision-making counsels for relevant government departments. In the process of local economic and social progress, higher vocational colleges, as disseminators of knowledge and culture, should make full use of the advantages of full sets of research schools and intense talent aggregation to establish think tanks of experts and to bring them to full play. Teachers
should apply for research projects organized by local governmental departments, take initiative to participate in the study on local policies, mechanism and development strategies, and provide best decision-making, strategy, ideas and methods for local development. During the process, colleges can achieve positive interaction with the government while fulfilling its own role at the same time.

**Conclusion**

Scientific and accurate positioning is the prerequisite and foundation for sound development of higher vocational colleges. The accurate development orientation of higher vocational education is built on profound analysis and understanding of higher vocational educational theories, so we need to incorporate theories into reality to clarify concrete contents of the three major functions, to fully exert our own advantages according to practical situation, to build up features, to solve the problems of "what kind of schools should be established" and "how to establish good schools", and finally put the three functions into full play. Scientific research is a fundamental function of higher vocational colleges. The scientific research positioning in higher vocational colleges cannot do without the overall orientation so that research positioning should be placed inside the whole advancement framework to ascertain its objectives, types and contents.

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