

Contributions of Vocational Technical Education to Regional Economic Transformation

---- Take “Reindustrialization” in Northeast China for Example

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ABSTRACT: The revitalization of the Old Northeast Industrial Base is the regional economic transformation that reforms traditional industries with new technologies, which depends on the improvement of regional talent level, thus bringing about great demand for talents. The utility education mission of vocational technical education makes it responsible for training a great batch of high quality skilled shortage talents for industrial society and urban-rural laborers who have the awareness of green production and production capacity. The major structure of vocational education in Northeast China is not reasonable enough and urban-rural continued education and training are severely inadequate. Therefore, vocational technical education in Northeast China is in dire need of updating talent concept, optimizing investment structure and mechanism, accelerating the development of secondary vocational education and enhancing the supply & demand effectiveness of vocational education in Northeast China so that vocational technical education can contribute to “reindustrialization” of Northeast China.

KEYWORD: Vocational technical education; Northeast China; economic transformation of reindustrialization

1 CONNOTATIONS AND FEATURES OF “REINDUSTRIALIZATION” ECONOMIC TRANSFORMATION IN NORTHEAST CHINA

For correct settings of According to the comparative advantage principle proposed by David Ricardo, “reindustrialization” is the inevitable choice of the Old Northeast Industrial Base in order to adapt to economic development and industrial study rules. However, “reindustrialization” is no longer a simple problem at the technical level but a comprehensive and systematic project which is about full economic and social reform of the base. Pursuant to requirements of the systematic project, the “reindustrialization” of Northeast China covers the five following aspects of transformation[1]:

1.1 *Transforming from Industrial Northeast to Knowledge Northeast*

Knowledge economy since its emergence as an independent economic form has gone beyond the Lewis dual economic structure of developing countries’ economic development and formed a ternary economic structure with coexistence of agricultural economy, industrial economy and knowledge economy. Under the ternary economic structure, the core and key to the implementation of “reindustrialization” in the Old Northeast Industrial

Base is to transform traditional industries with information technology, high technology and appropriate technology, and realize fundamental transformation of heavy chemical industry technology, that is, from industrial Northeast to knowledge Northeast.

1.2 *Transforming from Capital Center to Human-oriented Center*

In the era of agricultural economy, land was the core factor and played a dominant role in the development of agricultural economy; the industrial economy turned the role of capital into the first production factor; after knowledge economy came into being, knowledge became the primary productive force and decisive, thus unprecedentedly highlighting the importance of education departments. In the process of “reindustrialization”, the base must transform from the capital center to human-oriented center step by step to harmonize capital and human orientation[2].

1.3 *Transforming from Extensive Economy to Ecological Economy*

Northeast China boasts relative resource advantage but with over fifty years’ extensive development, the accumulated resource and environment problems are

quite grave: first, the expansion of resource dependent industry scale compounds the resource sharing contradiction; second, extensive development leads to regional environmental deterioration and ecological degradation; third, the problem of sustainable development is obvious for resource-based cities. It means that Northeast China needs to save energy, reduce emission and carry out green production while maintaining rapid economic development. "Reindustrialization" itself contains solutions for solving the contradiction between heavy chemical industry development and resource environment.

1.4 *Transforming from Individual Fight to Joint Breakthrough*

First, three provinces in Northeast China needs to conduct industrial chain integration with professional labor of division in industries of the region from the height of regional economic integration, thus building overall industrial advantages to fight against other competitions; second, they should give full scope to the radiation effects of central cities, accelerate the promotion of regional growth center, drive urbanization development and lay a space foundation for "reindustrialization" of the Old Northeast Industrial Base; third, they should realize regional "government integration" to build a new regional economic coordination mechanism.

1.5 *Transforming from Limited Opening to Full Opening*

First of all, they should be open to other regions of the country, strengthen economic cooperation with developed regions and central & western regions, shorten the gap between the north and the south, and materialize "interaction between the east and the west". Second, they should be open to the world. Without a global platform which integrates technology and market, the "reindustrialization" progress of the Old Northeast Industrial Base will slow down and even be suspended.

2 PRACTICAL DEMAND OF ECONOMIC TRANSFORMATION IN NORTHEAST CHINA FOR VOCATIONAL TECHNICAL EDUCATION

Effects of vocational education influences local economic development and it is more so in underdeveloped regions. The country supports the adjustment and transformation of the Old Northeast Industrial Base and implements the strategic decision of revitalizing Northeast China and other old industrial bases [3]

2.1 *The Highest Priority Is to Train a Great Batch of High Quality Skilled Shortage Talents*

Three provinces in Northeast China have intensive large and medium-sized enterprises. In 2005, the number of large non-state-owned industrial enterprises above designated size only was 899, accounting for 10.3% of the national total. The industrial system which regards heavy industry and petrochemical industry as its pillar industries in Northeast China is well developed with huge inventory, high scientific and technological content and high management level. The strategy of driving industrialization with informationization and taking a new path to industrialization motivates more demanding requirements for corporate employees' skills and leads to reduction in the number of skilled labor. Intermediate and advanced skilled talents are becoming subjects of large and medium-sized state-owned enterprises. Yet, at present, a phenomenon exists in human resources of Northeast China, that is, more literal arts talents, basic course talents and production management talents, and fewer entrepreneurs and engineering talents, applied talents and operation & marketing talents. In particular in manufacturing industry and modern service industry, for instance, the gap for numerical tool operators is 600,000 and the gap for "software blue collars" is 400,000; the annual demand for automobile maintenance staff is 300,000 and for nurses is 150,000. According to statistics, three provinces in Northeast China needed 400,000 advanced applied talents and 1.5 million intermediate skilled talents in 2010. Training skilled shortage talents is the priority for current vocational education in case of serving the Old Northeast Industrial Base.

2.2 *They Should Strengthen Vocational Education Receivers' Green Production Awareness and Production Capacity*

In accordance with related material analysis, most of the environmental pollution incidents of industrial enterprises in Northeast China that brought about grave consequences are caused by skilled workers' weak sense of environmental responsibility, violation against operation regulations and inappropriate technological operation, etc. If enterprises hire a great number of talents with green production concept, they can indirectly improve economic benefits through means such as energy saving, garbage recycling and prevention of pollution dispersal. It's a kind of potential investment to enterprises and even the entire society. It can be noted that skilled workers' environmental awareness and sense of responsibility have major impact on control of environmental pollution and occurrence of environmental pollution incidents. Hence, education especially the training of professionals is the strategy promoted by green industries. They need to learn about influences of the

to-be-engaged jobs over ecology and personal health, and grasp knowledge and skills which can minimize such implications. By doing so, in future, they can select reasonable work solutions and technologies at work, adopt the right working means and methods and try to reduce the danger to environment and human health as much as possible. For instance, students whose majors cover pollutant discharge such as chemical engineering, mineral, papermaking, pharmacy and biochemistry must deal with matters related with production process, engineering development, mining industry and energy utilization, etc. If these students don't bear harmonious and sustainable development consciousness and don't know how to correctly apply knowledge and technology which facilitates harmonious environment development, they may cause tremendous implications and danger to ecology after shouldering social responsibility[4].

2.3 *The Task of Enhancing Urban-Rural Laborers' Overall Quality Is Arduous*

Improving the overall quality of urban-rural laborers and realizing harmonious urban-rural development are important foundations for revitalization of Northeast China economy. Accordingly, vocational education and training are in urgent need. The resources of vocational schools should be made most of to carry out varied vocational training activities. Currently, the number of employees in industrial and mining enterprises of Northeast China is about 25 million. Calculated based on the minimum requirement of 30% training rate, 7.5 million person-times should be trained every year. As the reform of state-owned enterprises is sped up, about four million laid-off employees must be trained so as to boost re-employment. At the same time, Northeast China is an important base of agricultural production and solving the "three rural" problems is significant to the revitalization of the base. Making great efforts to promote practical technology and conducting applied technology training on farmers is the key to developing modern agriculture of Northeast China. As a result, three provinces in Northeast China have formulated farmer training plans and Heilongjiang planned to train three million person-times every year. It's predicted that three provinces together will train eight million person-times of rural laborers every year. The training tasks of rural-urban migration laborers are considerably heavy as well. Jilin planned to conduct skill training on two million urban-rural labor including rural migrant workers in the coming five years while Heilongjiang expected to train 400,000 rural-urban migration laborers every year. Every year, the three provinces train about two million rural-urban migration laborers in total. To sum up, the development of regional is closely related with the development of vocational education. Effects of vocational education influences local economic development, especially for

underdeveloped regions. Supporting fast adjustment and transformation of the base and carrying out the strategic decisions such as revitalizing the Northeast are not only urgent need of the northeast reform and development but also important strategic initiative for the national coordinated regional economic development as well as playing a significant role in building a moderately prosperous society in all aspects, realizing the modernization construction goals and promoting regional cooperation of Northeast Asia. Only when vocational education is applied to turn scientific technology and knowledge that are suitable for local economic construction into realistic productivity can it bring along economic development of the entire region and serve the revitalization of the Old Northeast Industrial Base.

3 STRATEGIES FOR GREATER CONTRIBUTIONS OF VOCATIONAL TECHNICAL EDUCATION TO "REINDUSTRIALIZATION" OF NORTHEAST CHINA

3.1 *Optimizing Vocational Education Development Environment and Mechanism, Reducing Expected Cost and Enhancing Prospective Benefits*

First, they should reinforce opinion orientation and reduce psychological cost for choice of vocational education; second, they should conduct personnel and distribution system reform, enhance the expected benefits of vocational education, set up a skilled worker promotion system that is helpful to talent training and use, go loose on promotion conditions and don't prefer identity, education background and experience. Third, they should perfect the vocational education system and expand the space for development of vocational education graduates. Besides, they need to develop different forms of higher and secondary vocational education and training, further polish the lifetime education system, communicate and link the general education with vocational education, primary, intermediate and higher vocational education, give full scope to advantages of vocational education, carry out varied training activities and integrate them to the construction of learning society.

3.2 *Accelerating the Development of Secondary Vocational Education and Increasing Average Age Limit and Quality of Vocational Education Receivers*

Today, many developed countries still have great demand for secondary vocational education. 70% of German adolescents choose "dual system" vocational education after graduating from junior high school. Some arts and science students don't go to college immediately after graduating from senior secondary schools; instead, they receive vocational education first so as to obtain certain professional qualification and practical experience. Vocational

education accounts for over 60% in most of EU countries. Germany and other countries responded, "The best preparation for unified market competition is to strengthen vocational education and improve service and product quality." In order to carry out macroscopic instruction and supervision over vocational schools through guidelines, policies, rules and regulations, the following aspects should be achieved: the government shall include the development of vocational technical education in the overall planning of local economic and social development and give priority to develop it as a basic industry; formulate vocational technical education policies; plan as a whole and organize different forces to develop vocational technical education, arrange school and major layout and optimize the allocation of education resources; fully monitor vocational technical education scale, structure, quality and benefits, set up an evaluation system and establish schooling qualification assessment and education & teaching level standard, and do a good job in backbone model schools.

3.3 *Optimizing Investment Structure Proportion and Mechanism and Facilitating Coordinated Development between Vocational Education and Northeast China*

On the one hand, they should optimize the education investment structure, promote coordinate development between vocational education and related education, properly increase the investment in higher education and secondary education, reduce investment in individual education receivers, boost efficient, healthy and coordinated development of varied education categories and realize supply & demand balance as much as possible. First, total education investment should be reasonably distributed among different education categories to ensure that the rate of return is equal to the total cost (including opportunity cost) for all education categories. Second, social public interest investment and individual investment proportions should be allocated in a reasonable way to ensure effective supply & demand. The ratio relationship between individual education cost and rate of return should be adjusted to let individual unit cost of all kinds of education obtain equal marginal utility, that is, make individual effectiveness and private cost equal. On the other hand, they should optimize vocational education investment mechanism and prompt close combination of vocational education and economy. Related education investment policies should be stipulated and improved to set up a flexible and diverse indirect investment mechanism, let market demand participate in or determine the allocation of vocational education resources, and enhance the input-output ratio and social rate of return while amplifying the multiplier effects of education investment capital.

3.4 *Improving "Reindustrialization" Quality, Market Allocation Mechanism and Effectiveness of Vocational Education Supply & Demand*

The financial market mechanism should be further improved to solve such problems as "misallocation of resources" and unbalanced industrial structure and severe shortage in knowledge "grey collar" and "white collar" staff. First of all, the role of market in resource allocation should be attached great importance to. The government should establish vocational education market access system, set up market access standards for vocational education, job training and varied social education categories, legally standardize education behaviors of investors and schooling operators, attract more social capital to education market (field), guide the market correctly, mobilize all social forces to take part in the reform and rebuilding of education structure, and truly build a vocational education operation and regulation mechanism which is market oriented. Second, the government should give full scope to functions of social intermediaries. The government should proactively develop non-governmental and non-corporate "third sector" and ensure healthy development of vocational education at a microscopic level; implement the identification of professional qualifications and continuing education qualification, international standard identification of secondary vocational schools and non-state-run schools, advanced vocational school discipline quality assessment ranking, asset appraisal and public income and expense audit of vocational schools, employment supply and demand information consultation, reliability identification of academic and professional qualification certificates, etc.; Besides, the government should regard government investment as the leading factor and corporate and community support as auxiliary factors, apply computer network and information technology, improve the management information system which closely combines social employers and schools, and give full play to the consultation and supervision roles of employers, school boards, alumni associations and expert committees, etc. in vocational school scale, major and course adjustment.

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