

Research on the Quality Structure of Internationalized Railway Talents

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Abstract: The pace of China's railway going global has accelerated, and it has taken the leading position in the world in many technical indexes, so the demand for international talents has increased dramatically. This paper analyzes the requirements of international talents' quality structure from academia, universities and enterprises, and discusses the quality structure of international railway talents and its connotation from four dimensions: knowledge vision, general skills, special skills and quality conditions, in order to provide reference for the cultivation of international railway talents in China.

1. Introduction

In June 2020, the *Opinions of the Ministry of Education and Other Eight Departments on Accelerating and Expanding the Opening of Education to the Outside World in the New Era* was officially issued, and how to further expand the opening of education to the outside world and cultivate high-level international talents with global vision are all important topics worthy of attention at the moment. In December of the same year, the Information Office of State Council published a white paper on "Sustainable Development of Chinese Transportation", pointing out the key directions of future railway development and other issues, and striving to promote high-quality railway development. Railway is an important area to promote the "One Belt, One Road" initiative, and as the pace of railway "going out" accelerates, the demand for international talents is increasing, especially for high-quality inter-disciplinary international railway talents. At present, there is a large shortage of internationalized railway talents, and the reserve of inter-disciplinary talents who are well versed in both professional technology and language is relatively small, which cannot meet the needs of China's high-speed railway "going out". Therefore, a systematic analysis of the quality structure of internationalized railway talents can effectively clarify the direction for the cultivation of internationalized railway talents.

2. The Elements of the Quality Structure of Internationalized Talents

Different academics have different definitions of talent quality, and according to the literature, quality talents can be divided into three categories, namely international, innovative and vocational, with differences in the quality elements. The quality structure of international talents is focused on professional qualities and abilities, personality traits and other qualities [1], the innovative talents is focused on scientific and cultural qualities and moral qualities [2], and the vocational talents is focused on consciousness and moral qualities and comprehensive professionalism [3].

3. Research on the Quality of International Talents by Social Institutions

3.1 Quality of International Talents for Universities

The development of economic globalization promotes a strong demand for international talents. Countries all over the world are actively exploring and implementing strategies for cultivating international talents. As a rising power, China urgently needs a high-level international talent team

to participate in global competition. Universities are the highland of talent cultivation, especially international talents. Internationalized talents [4-5] usually contain four major quality elements, namely, knowledge, ability, quality, and consciousness attitude.

Quality composition of internationalized talents in colleges and universities mainly contains solid professional knowledge, professional application ability, correct ideological and political quality, foreign language ability, etc. At present, there are two main modes of internationalization quality cultivation for students in colleges and universities, which are internationalization of curriculum and foreign exchange study. The internationalization of curriculum can make students gain broader development in consciousness, knowledge and vision. Foreign exchange study includes Sino-foreign cooperative study, student exchange program, double degree program, etc., with obvious effect on the improvement of students' internationalization quality.

3.2 Quality of International Talents for Enterprises

Enterprises are the main players in the market involving in China “going global”, and international talents are an important support for the international development of enterprises. The current research on internationalized professional and technical talents is mainly concentrated in the fields of petroleum [6], engineering[7], etc. Their talent competence is mainly concentrated in the two dimensions of engineering expertise and internationalization capabilities. Among them, the internationalization capabilities of engineering and technical talents contain professional international knowledge and professional international skills, as well as comprehensive qualities and values that adapt to an international working environment. Professional technical international talents are mainly divided into market development-related personnel, engineering management-related personnel, and technical-related personnel. The training of international professional and technical personnel is mainly carried out in the mode of school-enterprise cooperation.

The literature analysis shows that the quality composition of international talents in enterprises mainly contains solid professional knowledge and skills, team consciousness, global vision, business quality, etc. Enterprises develop training mechanisms to meet the international talents of different industries and different positions respectively.

4. Building the Quality Structure of Railway International Talents

The demand for talents for railway “going out” is characterized by extensiveness, dynamism, continuity and composite. Extensiveness refers to the diversity of specialized talents in demand; dynamism refers to the fact that at different stages, the types and levels of talents in demand vary a lot; continuity refers to the fact that the demand for international talents in railway “going out” is continuous in time for a long period of time in the future; inter-disciplinary talents refers to the fact that the knowledge vision, general skills, specialized skills and quality conditions of talents are in urgent demand. The composite talent refers to the higher requirements on the knowledge vision, general skills, special skills and quality conditions of talents.

The cultivation goal of internationalized railway talents is to adapt to the needs of social and economic development, to cultivate a large number of composite talents with solid professional foundation, international vision, familiar with international rules and practices, and strong ability to adapt to the environment and international communication. On the basis of the analysis of internationalized railway talents' ability and the specific business needs of Chinese railway “going out”, the index system of internationalized railway talents' quality structure is constructed. According to the four dimensional layers of knowledge vision, general skills, special skills and quality conditions, the indexes are refined, integrated and adjusted again, and 28 secondary index layers are extracted from the internationalized railway talents competency model. They are shown in Table 1 below.

Table 1 : Quality Structure of Internationalized Railway Personnel

Target layer	dimensional layer	Indicator layer
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Overseas Railway Project Talent Capability	Knowledge Vision	International Perspective
		Internationally prevailing rules
		International engineering experience
		Professional knowledge mastery
		Comprehensive country-specific knowledge
	General Skills	Learning ability
		Information processing ability
		Execution ability
		Communication skills
		Planning ability
		Decision-making ability
		Coordination and organization skills
		Teamwork ability
	Specialized skills	Language skills
		Human Resource Development Capability
		Cross-cultural working ability
		Risk Control Capability
		Financial Asset Management
		Legal Affairs
		Marketing
	Project Management	
	Quality conditions	Political sensitivity
		Responsibility
Customer awareness		
Self-confidence		
Adaptability		
Stress resistance		
	Ability to cope with changes	

4.1 Knowledge Vision

International Perspective include, among others, a deep understanding of the international general knowledge of the profession; familiarity and mastery of consistent international practices and routines; familiarity with the international market rules of the industry; stress-free organization of international events; and a high level of acceptance of diverse cultures. Internationally prevailing rules includes familiarity with international standards and practices, as well as having a full international practice, which is a prerequisite for international talent to carry out projects. Internationally prevailing rules refers to the richness of experience in international engineering-related work. For professional knowledge mastery, to be able to restore the theoretical content of professional knowledge and organize a rational sequence of work tasks according to the figurative situation of job work, and to accumulate and strengthen action experience in the process of applying the rules of knowledge in this way. Comprehensive country-specific knowledge includes knowledge of international affairs and national conditions.

4.2 General Skills

For Learning ability, the ability to learn new knowledge, transfer and apply new knowledge, self-seeking and self-improvement. Information processing ability is the ability to obtain project-related information through various channels, and analyze and process various information, and draw reliable conclusions and propose processing solutions in a targeted manner. Execution ability is to accurately understand and grasp the client's intent, effectively utilize resources, implement strategic intent, and complete the project's intended goals and the goals of one's position with quality and quantity within the established time frame. Communication skill involves communication not only between peers, but also between superiors and subordinates. Planning ability refers to the ability to define goals, break down tasks, clarify work, and plan operational processes, standards and acceptance. Decision-making ability refers to the comprehensive ability to make effective judgment on obtaining information, and to make reasonable decisions and grasp the direction. Coordination and organization skills refer to the ability of using various organizational

forms and coordinate human, material and financial resources to achieve optimal goals. Teamwork ability puts the common good of the team first and possesses the ability to work harmoniously and cooperatively with team members under the team goal. For language skills, the countries along the “Belt and Road” involve about 53 official languages, and the engineers and technicians involved in the construction along the route must master the official language of the country they are in, in addition to the internationally accepted English.

4.3 Specialized Skills

Human resource development capability refers to the ability to understand the method of acquiring and cultivating human resources in overseas engineering environment, to absorb high-quality human resources from home country and local area, to manage and train them appropriately, to make the best use of their talents, and to realize the localized management of human resources to a certain extent. Cross-cultural working ability is to work cross-culturally is the ability to adapt to different cultures in various countries and regions and to work collaboratively with people from different cultural backgrounds to achieve the goal of working harmoniously as a team. Risk control capability refers to the ability to reasonably predict risks in the overseas engineering environment, to react quickly when the external environment changes or project risks occur, to analyze risk categories and possible impacts, and to formulate risk prevention and response measures. Financial asset management capability refers to the efficiency of managing financial assets in an overseas engineering environment. Legal affairs capability requires relevant personnel to master basic legal theoretical knowledge and legal support expertise, and have the ability to analyze and solve common legal affairs problems at the grassroots level. Marketing ability mainly examines the ability of marketers to carry out business activities and sales behaviour for the market. Project management skills require managers to have strong logical thinking skills and strong general skills.

4.4 Quality Conditions

Political sensitivity means that engineers are required to have national self-confidence, institutional self-confidence, cultural self-confidence and strong psychological quality, to be able to unshakably and firmly take a political stand when challenged, and to consciously safeguard national interests and international image. Responsibility refers to compliance with norms and responsibility. Customer awareness refers to the desire and consciousness to pay attention to and understand the owner's (customer's) requirements for the project and to make rationalized suggestions to serve the owner proactively. Self-confidence is the conscious characteristic and psychological state of expressing self-worth in a positive and effective way. Adaptability mainly focuses on the project manager's understanding of the project site environment and the personality traits to adjust themselves to the new environment. Stress resistance mainly examines whether the project management staff can maintain efficient working condition and ensure the quality of work under the high-intensity and high-stress working environment. Ability to cope with changes refers to the ability to react quickly when something changes in the outside world, or to make a decision quickly after a lot of thought process.

5. Conclusion

Railway is an important area in the national strategy of “One Belt, One Road”, and with the continuous expansion of Chinese railway overseas market, a large number of international railway talents with comprehensive quality are urgently needed. Based on the development of railway-related business, this paper analyzes the quality structure of internationalized railway talents from four levels of knowledge vision, general skills, special skills and quality conditions with 28 indicators, and provides reference for China's internationalized railway talents training research. As China's railway plays a significant role in the process of “One Belt, One Road”, the society can start from the quality structure of internationalized railway talents, carry out research on the training mode according to the needs of different positions, cultivate and improve the quality of

internationalized railway talents, and lay the foundation for China's railway to “go out”.

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