

Analysis and Practice on the Path of Internationalization Development of Rail Transit Vocational Colleges under the Initiative of the Belt and Road

——An Example of Guangzhou Railway Polytechnic

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Abstract: The initiative of “the Belt and Road” brings opportunities and challenges to the international development of rail transit vocational colleges. Taking Guangzhou Railway Polytechnic as an example, the framework of internationalization of Jane Knight’s educational theory is used to define five liquid factors such as the mobility of personnel, the flow of educational projects, and the flow of providers in the internationalization development of rail transit vocational colleges as well. In this paper, the motivations of internationalization are explained; the problems in the dimensions of five liquid factors are analysed, and the organizational strategies (“MOST” model of “management alliance, operation mechanism, support service and talent development”) and political strategies (“TTSA” model of talent cultivation, teaching staff, specialty construction and assistance training) are adopted to effectively explore the path of internationalization development of the Guangzhou Railway Polytechnic, providing a reference for the high-level education and talent highland of other rail transit vocational colleges, and promoting the strategic upgrade of 4.0 of China’s global “going-out” of high-speed railway and “opening-up” to the outside world.

I. Introduction

In August 2016, the *Action on Promoting the Belt and Road Education* (“the Action”) was published by the Ministry of Education of the P.R.C. with the purpose of fully implementing the *Several Opinions on the Opening Up of Education in the New Era*, providing intellectual support for the BRI construction through talent cultivation, and facilitating facilities connectivity and cultural exchanges. The Action pointed out that local governments shall highlight the main and the supporting role of the Belt and Road Initiative (hereinafter referred to as the BRI), and promote the implementation of the BRI^[1]. Thus, there is a question for Guangzhou Railway Polytechnic (GRP): as a key node city along the Belt and Road and the only higher vocational college in Guangdong Province that trains rail transit talent, how should the college respond to the BRI and how to give full play to its role as a highland for rail transit talent at home and abroad and as a bond that enhances mutual cultural trust among countries along the Belt and Road? By employing Jane Knight’s international educational theory, this paper analyses the internationalization factors, motivations, and problems of international rail transit colleges and proposes solutions from two aspects: organizational strategies and political strategies.

II. Measures

2.1 Analysis Of Factors Regarding The Internationalization Of Rail Transit Vocational Colleges Under Jane Knight’s International Educational Theory

According to the international higher education theory proposed by Pro. Jane Knight, a famous Canadian scholar focusing on internationalization of higher education, in her books *Internationalization of Higher Education in Asia Pacific Countries* and *Cross-border Education*:

Changing Procedure and Provider, the internationalization involves five fluid factors including personnel, educational projects, providers, project engineering and services, and policies^[2]:

First, the mobility of personnel. The subject is personnel, including students, professors, researchers, experts, etc. Students may get involved in overseas study, internship, etc. while professors may participate in academic exchange, education consulting, etc.

Second, the flow of educational projects. The subject is educational projects, including joint training, double degrees, student partners, franchising, remote education, etc.

Third, the flow of providers. The subjects include educational institutions, companies, enterprises, etc. and the flow form includes establishing overseas branch colleges or educational institutions, acquiring institutions, etc.

Fourth, the flow of project engineering and services. The subjects include educational projects and services, and the flow form includes scientific research, curriculum design, education service, capacity building, etc.

Fifth, the flow of policies. The subjects include academic/management policies at state level or institutional level, etc. and the flow form includes talent cultivation, teaching staff, specialty construction, training assistance, and other quality assurance or stimulating policies.

2.2 Analysis Of Motivations Regarding The Internationalization Of Rail Transit Vocational Colleges Under Jane Knight's International Educational Theory

Motivations regarding the internationalization of rail transit vocational colleges involve four aspects: social culture, politics, academy, and economy (as shown in Table 1), which define the position and orientation of the college's development^[3].

Table 1. Framework of Motivations Regarding the Internationalization of Rail Transit Vocational Colleges

	Social culture	Politics	Economy	Academy
Motivations	Recognition of Chinese culture	The implementation of foreign policies including major country diplomacy, the BRI, and the “going global” of the high-speed railway, and the founding of strategic alliance	The need for economic growth of China featured by high-end manufacturing like the high-speed railway, for complying with economic globalization, international trade and investment pattern, and multi-lateral trade rules, and for boosting international competitiveness in business trade	The need for complying with modern vocational education system and public educational resources, promoting the development of colleges and students, elevating the reputation and standing of colleges, teachers, and students, and implementing education aid
	The development and understanding of diversified cultures of countries along the Belt and Road and of the BRI silk	The need for maintaining cooperation and opening-up of regions, and the safety of costal industry and core	The increase of demand in rail transit labour market resulted from the regional industry transformation,	The need for rolling out talent education standard concerning “going global” of the high-speed railway, realizing talent cultivation, joint

	trade	infrastructure	upgrading, and transfer	training of teaching staff, and exchanges and cooperation on scientific research and technical service during the internationalization of rail transit specialty
	The development of Chinese citizenship	Peace and mutual understanding between China and border areas	The need for growing population and economic scale in countries and regions along the Belt and Road resulted from China's overcapacity, excessive foreign exchange assets, and financial innovation	Expand the dimensions in internationalization of rail transit, and improve teaching quality and core competitiveness
	Meet the demand for social informationization, and the development of socialism and the community group	Nation recognition	Realize income generation through "high-speed railway economy" and ease the financial burden of China's dependence on foreign oil and gas, mineral resources, and so on	Improve the level of running colleges through international cooperation, expand the vision of academic study and enrich resources in the rail transit field, and promote the discipline building and revenue generation

Source: a summary written according to Knight, 2005b

III. Problem discussion and solutions

According to Jane Knight's international educational theory, the internationalization of rail transit vocational colleges complies with the "Five-pronged Approach" (policy coordination, connectivity of infrastructure, unimpeded trade, financial integration, closer people-to-people bond), but there remain many problems to be solved in advancing internationalization.

3.1 The mobility of personnel

The inadequate support from governments, enterprises, and colleges slow down the mobility of personnel. First, there is lack of foreign assistance training projects on rail transit for "going global" of the high-speed railway funded by governments or enterprises; second, not enough channels are open for exchanges of rail transit vocational skills and cultural communication among governments and colleges in countries along the Belt and Road; third, colleges pay little attention to international cooperation like cultural exchanges, and provide inadequate support for projects including academic visits and study, overseas internship, academic exchanges, advanced studies, and international competitions in rail transit.

In view of the aforesaid problems, GRP, by relying on resources like the High-speed Railway

Skill Training Centre, has developed such new approaches as the four-prolonged cross-border service mode of “training, competition, visiting, and overseas study” in an effort to facilitate personnel mobility. International trainings in rail transit have been provided to Southeast Asia, Africa, and Guangdong-Hong Kong-Macao Greater Bay Area; foreign railway assistance trainings have been provided to China Railway Group Limited, China Railway Construction Co., Ltd. and other Chinese-invested companies. Six sessions of foreign railway assistance training projects have been organized and benefited 197 people, including power supply and electricity service training of Addis Ababa-Djibouti Railway in Ethiopian, training provided to personnel engaged in rail industry in Thailand, railway management officials and personnel involved in operation and management of railways in Zambia, and theory training on customized overhead line system design of Mass Transit Railway. GRP has also launched international competitions on improving vocational rail transit skills for countries along the Belt and Road, organized students to participate in Malaysia SOLIDWORKS Skill Competition and achieved excellent results of the 1st and the 2nd prize; launched academic study and exchange projects for teachers and students in Malaysia, received short-term visiting groups consisting of 40 people, and organized 68 people to take part in short-term overseas academic study; students involved in overseas academic study have got employed in foreign Chinese-invested enterprises and an international brand is taking shape.

3.2 The flow of projects

The failure of governments in countries along the Belt and Road or educational institutions at home and abroad to push the project ahead contributes to the stagnation in project launching. The reasons are concluded as follows: first, at the government level, it takes a long time to go through the approval process of Sino-foreign joint educational programs, which slows down the progress of rail transit cooperative projects; second, there is lack of market research and accreditation of projects, like double degrees granted by higher vocational colleges and “degree + X certificate”, and graduates do not receive recognition they deserve, which cause trouble in attracting students and expanding the scale of college-running; third, the inadequate social propaganda for rail transit graduates has led to the misunderstanding that students will be employed as “blue-collar workers” rather than “white-collar technical workers” upon graduation^[4].

In light of the above-mentioned problems, GRP explores and operates new mechanisms, and, by relying on the “alliance”, looks for more resources for projects so as to boost social recognition of the diploma and increase employment opportunities. By adopting the “four-prolonged mode” to link governments, colleges, service institutions, and enterprises, GRP also makes active efforts to promote Sino-foreign cooperation, overseas college-running, and overseas academic study. First, GRP actively seeks support from the People’s Government of Guangdong Province and Guangdong-CIS International Technological Cooperation Union in an effort to streamline the application procedure. After carrying out market research and professional assessment, it joins hands with Belarusian State University of Transport to launch higher vocational education projects in rail transit operation and management specialty. Chinese students who are enrolled in the project and gain “double degrees + X certificate” will become international talent urgently needed by the international market in rail operation and passenger train operation. Second, GRP expands its influence with the help of media in China and Malaysia. It plans to build strategic partnership with international companies like Guangzhou Zhuoyue Qiancheng Education Services Co., Ltd., CRRC, China Railway Oriental International Group Co., Ltd. as well as Tunku Abdul Rahman University College (TAR UC) to jointly launch overseas programs of higher vocational education in locomotive specialty. Students from Malaysia will be able to study in China and Malaysia and obtain double degrees, and they will become international talent that serve in the locomotive overhaul and maintenance field in Malaysia. Third, GRP also cooperates with the Technical and Vocational Education Department of the Ministry of Education and Sports in Laos and 4 vocational colleges like Papasak Technical College to launch training programs of overseas academic study for Lao students. The programs target at international rail transit talent majoring in 3 specialties including power supply for electrified railway and have reached certain scale.

3.3 The flow of providers

The failure of education providers, including higher vocational colleges, educational institutions, companies, and enterprises, to provide adequate programs impedes their internationalization process. According to statistics released on the Information Platform for Supervision of Chinese-Foreign Cooperation in Running Colleges, as of December 31, 2018, there were a total of 741 programs and Sino-foreign higher vocational institutions that cooperate in running colleges, and only 8 of them were rail transit programs approved and put on record at the Ministry of Education. Among them, only 5 vocational colleges among others provided Sino-Russia, Sino-Canada, and Sino-South Korea vocational education programs in 4 specialties including urban rail transit vehicle technology and intelligent transport technology application^[5]. The reasons are as follows: first, at the state level, there is insufficient awareness on the “Five-pronged Approach” and win-win cooperation among countries along the Belt and Road; second, in the rail transit field, there are no such platforms that facilitate communication on jointly launching programs on running colleges; third, at the college level, as rail transit colleges would close themselves up without considering “industry background” and “combination of industry and education”, the graduates are unable to meet the requirements of employers.

In view of the above-mentioned problems, GRP explores new management mode and establishes the “council of the industry and education alliance” to facilitate the flow of education providers. First, by exploiting the advantages of transformation of rail transit industry and adhering to the two-way principle of “going out and bringing in”, GRP raises awareness in win-win cooperation and connects to 4 major areas including the CIS, Southeast Asia, Africa, and Guangdong-Hong Kong-Macao Greater Bay Area. With the support of the People’s Government of Guangdong Province, it also establishes the South China BRI Rail Transit Industry and Education Alliance (hereinafter referred to as the Alliance, as shown in Figure 1) by joining hands with rail transit vocational colleges, industry associations, key enterprises, and governments and colleges in countries along the Belt and Road. Second, it builds an open rail transit communication platform combining industry and education to expand channels for communication. To this end, quality education providers (including 2 foreign colleges like TAR UC and Belarusian State University of Transport, 15 domestic colleges and universities like Beijing Jiaotong University and Southwest Jiaotong University, and 17 companies like China Railway Guangzhou Group Co., Ltd. and Guangzhou Metro Group Co., Ltd.) are effectively integrated to provide customized training for international talent that meet the market demand of promoting “going global” of the high-speed railway. Positioned as serving the BRI construction and guided by the principle of the *Memorandum of Association*, the Alliance establishes the management system with GRP as the Chairman unit of the board of directors and takes the international exchange platform as a way to facilitate cooperation and cultural exchanges between education providers at home and abroad.

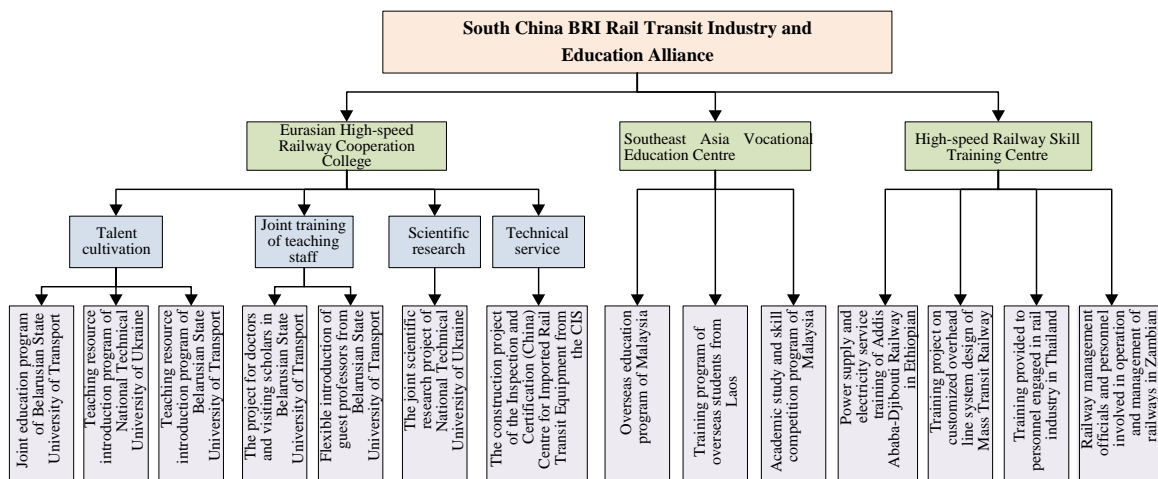


Figure 1. South China BRI Rail Transit Industry and Education Alliance

3.4 The flow of project engineering and services

The teaching staff, curriculum building, scientific research, and technical service in rail transit still lag behind in the international academic community, and thus there is lack of top-level design in human resource development. The reasons are as follows: first, at the state level, the cooperative system combining industry, education, and research in the rail transit field needs improvement; second, in respect to higher vocational education, the international academic resources like “teacher, curriculum, science, and technology” in the rail transit field need further integration; third, at the college level, colleges need to look for more professional teachers qualified for teaching in two different languages and with working experience in a global context and provide training to them. According to statistics released by the *Annual Report on Vocational Higher Education*^[6], the number of full-time overseas students studying in China’s vocational colleges in 2018 reached 17,000 and countries along the Belt and Road become the major place of origin of international students and the main destination of launching overseas colleges. In addition to that, the 16,000-kilometre railway to be built as negotiated by China and countries along the Belt and Road may generate demand for 300,000 talent, which set an even higher demand on international talent training in the rail transit field.

As regards the above-mentioned problems, GRP explores new approaches to human resource development and strives to achieve high in technical talent training for the internationalization of rail transit specialty. By adopting a four-prolonged development mode integrating “teaching staff, curriculum, research, and technique”, it aims to build an internationalized “academic community of shared future” so as to advance project engineering and services. In terms of joint training of teachers, 15 foreign teachers are recruited for teaching specialized courses and some teachers may be selected to study in Belarus for the doctor’s degree and carrying out language training and academic exchanges. In respect to curriculum development, GRP would roll out curriculum standards like the safety standard for railway signalling jointly with Belarusian State University of Transport and highlight 3 vocational capability modules of foundation, specialty, and synthesis. It also gives full play to the complementary roles of domestic and foreign teaching resources by introducing “cloud computing” in China from National Technical University of Ukraine and opening courses like the BRI intercultural communication and international laws and regulations (as shown in Figure 2). In the field of scientific research, GRP carries out project research jointly with National Technical University of Ukraine, the Institute of Control Science of the National Academy of Sciences of Ukraine, and others, including “fatigue detection algorithm and system research for key staff in railway industry” and “research and application development of railway intelligent recognition and monitoring system supported by video-based dynamic information algorithm”. In the field of technical service, it launches the “Inspection and Certification (China) Centre for Imported Rail Transit Equipment from the CIS” jointly with Belarusian State University of Transport in an effort to carry out systematic service of equipment inspection and certification, which has greatly improved its academic status and facilitated the international flow of project engineering and services.

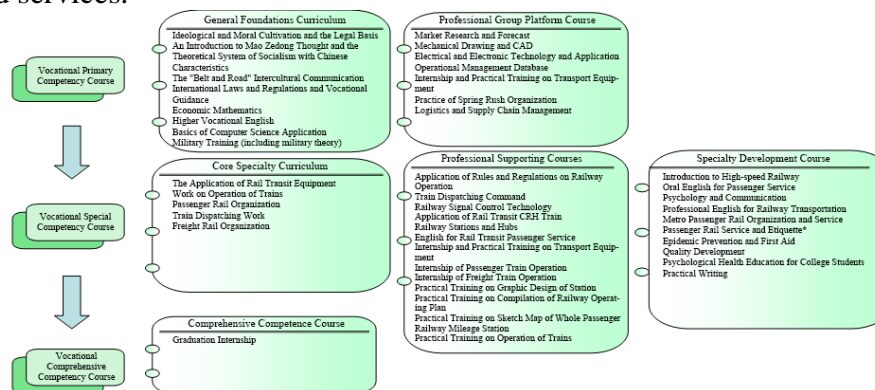


Figure 2. Curriculum of Professional Courses in Rail Transit Operation And Management

3.5 The flow of policies

Laws and regulations need further improvement in regard to education certification, guarantee system, and incentive mechanism designed for training of rail transit talent, specialty development, assistance training, etc. First, at the state level, policies concerning the assistance channel and mode in rail transit specialty among countries along the Belt and Road need to be enacted; second, in the field of vocational education, policy institutions and systems concerning the resource allocation, level classification, supervision and evaluation, credit transformation, and others of Sino-foreign cooperative projects need further improvement; third, at the college level, the institutional environment of foreign cooperation policy in the BRI construction need to be created.

In view of the above-mentioned problems, GRP plans to create and improve institutional environment to enhance institution construction and facilitate the flow of policies. First, in terms of talent training, supervision, assessment, and other strategies should be put in place to promote the “1+2” training mode designed for overseas students from Laos; second, in respect to teaching staff, relevant policies concerning “power supply for electrified railway” education standard should be formulated and professional teachers shall be encouraged to teach classes in overseas countries like Africa and the Southeast Asia so as to create demonstration projects of international cooperation on running colleges; third, in regard to specialty development, the college will formulate relevant policies on training of international talent, deepen cooperation with the MTR and the Railway Society of Guangdong Province, and develop professional teaching standard, curriculum system and standard, and professional teaching resource database that comply with the development of overseas rail transit industry; fourth, in terms of assistance training, it will roll out relevant policies concerning expanding the channel and mode of vocational education assistance and undertake training projects designed for Chinese staff working in overseas Chinese-invested enterprises, with an aim of establishing Luban Workshop in overseas countries by taking “power supply for electrified railway” as a pilot project and raising the brand awareness of China’s vocational education in the international community.

Conclusion

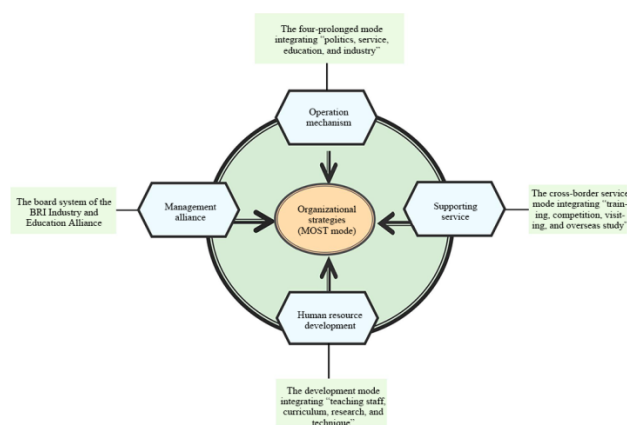


Figure 3. Organizational Strategies

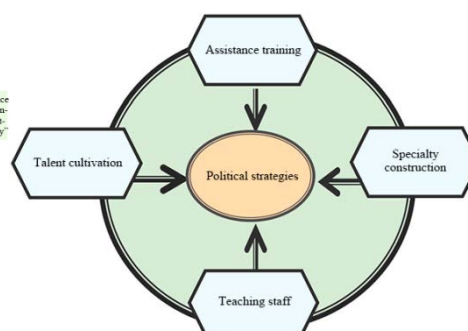


Figure 4. Political Strategies

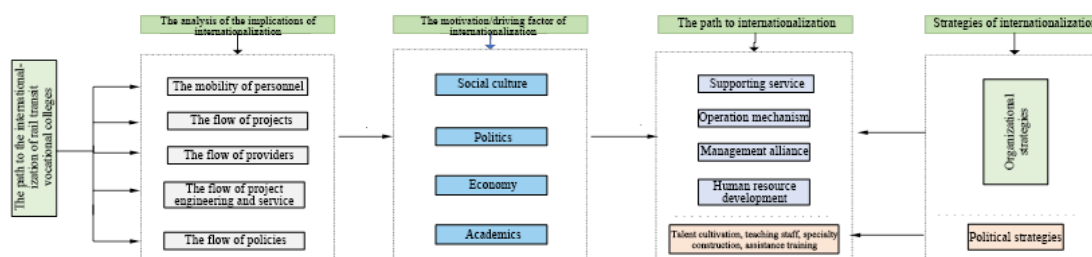


Figure 5. The Path to the Internationalization of Rail Transit Vocational Colleges

The internationalization of rail transit vocational colleges under the BRI is a systematic project

and the construction of its path is the key to its success. GRP has always been adhering to the idea of “building framework based on contents”, “defining orientation based on motivations”, “finding causes of problems”, and “finding approaches to solving problems”, and employs organizational and political strategies to promote “five liquid factors” (as shown in Figure 5), including the mobility of personnel under the internationalization theory, the flow of projects, the flow of providers, the flow of project engineering and services, and the flow of policies in the internationalization of rail transit vocational colleges. It applies the “4+4” mode, including 4 dimensions of management alliance, operation mechanism, support service, and talent development (the “MOST” model, as shown in Figure 3), and another 4 dimensions of talent cultivation, teaching staff, specialty construction, and assistance training (as shown in Figure 4) to put the aforesaid fluid factors into practice^[7], which has gained certain social recognition, improved its international reputation and influence, and made fair contributions to the BRI construction.

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