

A Critical Analysis of the Current Situation and Challenges Facing Technical Personnel in Material Production Enterprises

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Abstract: *From a human resource perspective, this study conducts an in-depth investigation into the development trajectory of the refractory industry and the current state of its workforce, systematically analyzing the prevailing conditions and challenges concerning technical personnel in refractory enterprises. The findings reveal that leading large-scale enterprises, despite maintaining a relatively well-structured composition of senior technical staff, continue to face a significant shortfall in high-level application-oriented technical and operational personnel. In contrast, small and medium-sized enterprises, constrained by a strategic emphasis on production capacity at the expense of research and development, are increasingly trapped in a self-reinforcing cycle of low wages, limited technical capability, and low labor productivity. Moreover, vocational students employed across various refractory enterprises experience a dual predicament: some perceive a lack of comprehensive theoretical knowledge, while others seek to enhance their practical competencies in equipment operation and fault diagnosis.*

Keywords: Refractory; Vocational Education; Current Situation.

1. INTRODUCTION

The rapid development of iron and steel, non-ferrous and petrochemical high-temperature industries, as well as the continuous progress of key equipment and technology, has greatly driven the scientific and technological innovation and industrial development of refractory materials in our country. our country has become the world's largest producer, consumer and exporter of refractory materials and refractory raw materials [1-2], but refractory is an applied discipline, refractory industrial enterprises are still short of technology applied talents in production, management, service, and lack in operators with certain professional knowledge and skills in various sections of workshops, laboratories and quality inspection positions. Especially with the continuous upgrading of refractory production equipment, process and quality control, as well as the high requirements of intelligent operation [3], the shortage of skilled people is becoming more and more serious.

There are many refractory enterprises in our country., with small and scattered scale, uneven technology and equipment level, advanced and backward production mode coexist [4-6]. the professional and technical personnel in these enterprises differ greatly and their problems are also different. By collecting, collating and comparing the relevant data of international tourism income, number of inbound tourists, and source distribution of inbound tourists in Taiwan and Hainan, this paper draws a preliminary conclusion that Taiwan's inbound tourism development level is relatively high and has a good development trend, while Hainan's inbound tourism development level is relatively low. Then the development experience of Taiwan inbound tourism is analyzed in detail. Finally, combining with the current status of inbound tourism development in Hainan, the paper draws some specific enlightenments from Taiwan's inbound tourism development, including improving tourism infrastructure construction, improving the comprehensive quality of tourism practitioners, strengthening the publicity of tourism destinations, developing tourism products with characteristics, and enhancing the participation of the government.

2. PRESENT SITUATION AND EXISTING PROBLEMS OF REFRACTORY ENTERPRISE PROFESSIONAL AND TECHNICAL PERSONNEL

Through the collection, sorting and analysis of various inbound tourism data from Taiwan and Hainan, this article draws the conclusion that Taiwan's inbound tourism development level is relatively high and Hainan's inbound tourism development level is relatively low. Then use the literature research method and the inductive analysis method to deeply explore the experience of Taiwan's inbound tourism development. It is found that Taiwan has a solid foundation for the development of tourism, continuously improves the tourism infrastructure, deeply develops rich and unique tourism products, and also launches targeted publicity to tourist destinations, which

ultimately resulted in a higher level of inbound tourism development. Although Hainan has a vast territory and rich tourism resources, due to the late start of tourism development, the low quality of tourism personnel, and insufficient development of tourism products, Its inbound tourism development level is not high. Therefore, the enlightenment of Taiwan's inbound tourism development to Hainan is drawn, which promotes the prosperity and development of Hainan's inbound tourism, And to a certain extent, it has enriched China's theory of inbound tourism development.

2.1 Leading Large Enterprises

In recent years, leading large refractory enterprises represented by Ruitai Technology, Punai Shares and Beijing Lear have gradually developed and grown up, these companies not only pay attention to production, but also pay attention to product research and development, so the structure of senior technical personnel is relatively reasonable, especially in recent years, along with corporate restructuring, whether state-owned enterprises or private enterprises, high-level talents are concentrated in leading large enterprises. However, according to the survey, these enterprises are still in short supply of high- tech application-oriented technical personnel and operational personnel, especially for those enterprises with modernized technological process and equipment. In the enterprise, both the basic management personnel engaged in process control and equipment management, and the operators engaged in raw material processing, blank forming, product firing in central control room cannot meet the present and future development requirements in terms of quantity and quality. Inbound tourism occupies an important position in the tourism industry. It can not only create foreign exchange for a country or region, but also create countless employment opportunities for the society, which is conducive to promoting the economic development of the country or region. Taiwan and Hainan are China's largest and second largest islands respectively. The geographical location, topography, climatic conditions, and species of the two islands are very similar, so natural tourism resources are similar. These constitute the basic premise of mutual comparison. Taiwan has abundant tourism resources and convenient transportation, and the development of inbound tourism started very early. It also has the advantages of a relatively complete tourism management mechanism, tourism service facilities, and strong tourism reception capabilities [1]. With the rapid economic development and the implementation of related policies, the development trend of Taiwan's inbound tourism has gradually surpassed regional tourism, and its share of the entire tourism industry has become larger and larger. However, Hainan's inbound tourism has been in a tepid state for a long time [2]. Although the country actively encourages the development and construction of Hainan International Tourism Island, and the tourism supporting facilities and tourism management system have been improved to a certain extent, there are still many shortcomings in the development of inbound tourism, there are still many shortcomings in the development of inbound tourism, such as incomplete development of tourism products, insufficient promotion of tourism products, low quality of tourist reception staff, hidden dangers in tourism safety, lack of special features in hotel accommodation, etc. [3].

2.2 Small and Medium-sized Enterprises

Due to the relatively small initial investment required to set up refractory factory and the low technological threshold, small and medium-sized refractory factories are numerous. Most of these enterprises are not as large as the leading enterprises in terms of scale and modernization, generally focus on production, not research. Graduates above college degree are reluctant to work for these companies, and the number of technical personnel above engineer title is limited. Most of the operators of all posts are recruited by the society after training, the cultural quality of the employees is generally low, the development momentum is obviously insufficient, especially today when the state advocates energy conservation and emission reduction, quality improvement and consumption reduction, these enterprises are facing greater pressure to survive, it is difficult to bear the cost pressure brought by raising workers' wages and improving welfare. In the end, low wages, low technology, low labor productivity lead to a vicious circle. Regarding Hainan's inbound tourism, domestic research focuses on its temporal and spatial characteristics. According to the law of regional differentiation and the theory of tourism flow, Su Peng used the IBCG matrix, the center of gravity model, and the shift-share analysis method to study the characteristics of the time and space structure of Hainan's inbound tourist source market and destination market, and pointed out the two major market structures. Then, the optimization plan was proposed [4]. Chen Yun and Tian Liang explored the seasonal characteristics of Hainan's inbound tourism, and concluded that inbound tourism evaded the peak of domestic tourism in January and February to form a trough. Institutional factors and natural factors together affect Hainan's inbound tourism seasonality [5]. Regarding Taiwan's inbound tourism, there are few domestic studies that explore Taiwan's inbound tourism alone, and most of them take the development of Taiwan's entire tourism industry as the research object, or conduct a comparative study of Fujian-Taiwan inbound tourism [6]. By establishing an econometric model, Liao Binbin explored the main factors affecting Taiwan's inbound tourism

demand, and found that tourism continuity, Unexpected economic events and social events have a significant impact on Taiwan's inbound tourism demand [7]. Based on the profound historical origins of Taiwan and Fujian, Yang Jianming and Bao Zhanxiong compare the characteristics of inbound tourism between Fujian and Taiwan, hoping that the two places can learn from each other's tourism development experience and promote regional tourism cooperation between Fujian and Taiwan [8][9]. Du Jun is currently the only scholar who associates Taiwan's inbound tourism with Hainan's inbound tourism. By studying the status, stages and characteristics of Taiwan's inbound tourism development, he summarizes its development experience and draws inspiration to improve Hainan's inbound tourism [10].

2.3 Employment Status of Refractory Material Professional Higher Vocational Students

Due to the different scale and technical level of enterprises, vocational students working in different refractory enterprises often face a dilemma. On the one hand, some enterprises realize the lack of investment in research and development and the lack of high-tech personnel, they had to let some vocational students engaged in refractory technology research and development, industrial design, these vocational students generally feel the lack of relatively complete theoretical knowledge system, and face many difficulties to product research and design work. Because after years of enrollment expansion of colleges and universities, college education gradually relegated to vocational education, despite the higher vocational and college degree is the same level of specialized subject, but the purpose of vocational education is to develop a certain cultural level and professional knowledge skills applied talents, compared with academic education, vocational education focuses more on the practical skills and abilities in actual work. On the other hand, for those leading large enterprises, high-level human resources with high technical level are relatively sufficient, while the higher vocational graduates who work in the production line generally think that they have learned more theoretical knowledge, but specialization they learned is narrow, its content is old, and the gap between what they have learned and the requirements of professional posts is large. There is an urgent need for skill training in process operation and other aspects to improve the ability to operate and deal with faults.

In addition, senior vocational students majoring in refractory materials generally believe that there is a lack of opportunities for re-education, and their promotion of professional titles is limited. According to the national policy, graduates of higher vocational education can apply for undergraduate and postgraduate education to continue their studies. But in fact, unlike other popular majors, refractory material major has no corresponding high-level undergraduate education and graduate education for them. Some students can only change majors if they want to improve their degree.

Because the refractory material specialty is narrow, the volume is small, it is difficult to carry out skilled professional qualification certificate like lathe worker, maintenance worker, surveyor and so on. At the beginning of this century, China Iron and Steel Association once hosted the professional qualification examination of refractory specific jobs. However, due to inadequate policies, insufficient cooperation between schools and enterprises, the professional qualification certificate could not be recognized by enterprises, and the professional qualification examination of refractory specific jobs was stopped for a long time.

3. SUGGESTIONS FOR REFRACTORY PRODUCTION ENTERPRISES

3.1 Correctly understand the industry orientation of refractory materials and improve the salary of technical personnel

Refractory industry has been called "hidden industry" and "basic industry" for high temperature industry [7] the new refractory material takes it as its service target to meet the needs of long life and energy saving of all kinds of domestic industrial furnace lining, therefore, it is not only a high energy consumption industry, but also a high-tech green manufacturing industry, and belongs to the field of new material technology. As the behind-the-scenes hero of the national high temperature industrial field, its development will not stop, but will only grow stronger. the graduates of refractory material major in vocational colleges will be able to display their talents quickly when they enter refractory enterprises

In refractory enterprises, except for high labor intensity molding, equipment inspection, quality inspection and raw material processing, billet preparation, product production post wages are still low, which should be appropriately increased.

3.2 Increase Factory-school Cooperation and Government Support

Doing well refractory material vocational education must have capital input. Governments at all levels in china pay more and more attention to the teaching development of higher vocational education, enterprises and schools should strive for the support of government special funds [8]. Students receive education in the school, and then go to the production site to practice operation, can really achieve the theory with practice and learn to use. Therefore, the school needs the support of enterprises to provide convenience for students to practice in the factory. It is best for the factory engineers, technicians and post operation technical workers to teach students and guide students to work on the premise of not affecting the normal production operation. Of course, businesses and schools need special funds to support them. Establish the mechanism of cooperation between colleges and enterprises to train talents, and implement the new mode of "order" education. Schools should enhance service awareness and actively meet the needs of enterprises; Enterprises should rely on schools to train new staff and in-service staff, sign staff training contracts with colleges and universities, give priority to graduates of cooperative colleges and universities, and actively participate in education and training activities of colleges and universities. It plays a leading role in determining training objectives, talent specifications, knowledge and skill structure, curriculum setting, teaching content and learning outcome evaluation, etc. [9] -[11], and establishes a school-enterprise cooperation system conducive to the sustainable development of higher vocational education.

4. DEVELOPMENT EXPERIENCE OF TAIWAN'S INBOUND TOURISM

4.1 The Construction of Tourism Infrastructure

The tourist public transportation facilities are well constructed: Taiwan has two international airports and several civil aviation airports, with direct flights to major countries around the world. Convenient transportation outside the island provides favorable conditions for inbound tourists to visit Taiwan. In addition, the criss-crossing road transportation network, convenient railway network around the island, and sightseeing trains around the island all give inbound tourists a good travel experience on the island. There are various types of tourist accommodation and reception facilities with large capacity, such as high-end hotels, family homestays, youth activity centers, international youth hostels, etc. [14]. Tourism statistics of Taiwan Tourism Bureau show that: As of January 2020, there are 127 tourist hotels in Taiwan with a total of 28,958 rooms; 3,365 general hotels with a total of 166,674 rooms; and 9,111 homestays with a total of 39,203 rooms. Taiwan's tourist accommodation and reception facilities can fully meet the travel and accommodation needs of tourists, and provide favorable conditions for the development of Taiwan's inbound tourism.

4.2 The Quality of Tourism Professionals

By reading a lot of travel notes about trips to Taiwan on travel websites such as Mafengwo, Ctrip, etc., it can be seen that tourists have a higher evaluation of Taiwan tourism practitioners. The overall quality of Taiwan tourism personnel is relatively high, most of them have mastered the corresponding professional knowledge, and have strong foreign language expression skills. They are enthusiastic, courteous, generous and decent in the process of communicating with tourists, giving inbound tourists a good service experience [15]. This is mainly due to: Taiwan attaches great importance to improving the overall quality of tourism employees, the Tourism Bureau organizes pre-employment training for tour guides, tour leaders, and tourism managers every year and provides tourism practitioners with a network platform that can learn vocational skills and improve their overall quality. Therefore, it also maintains the bond between schools and tourism companies. The "Taiwan Sustainable Tourism Development Plan (2017~2020)" also includes the training plan for key tourism talents, the training of new southward tour guides, and the strengthening of the industry retention mechanism.

4.3 The Promotional Tools of Tourism Product

Taiwan focuses on shaping the brand culture and attacking the international market. In 2009, the Tourism Bureau of Taiwan's Ministry of Transportation adopted "Taiwan-The Heart of Asia" as the new brand identity to promote internationally, suggesting that Taiwan's diversified characteristics of integrating tradition and trendy are the typical epitome of Asia that is taking off today. In recent years, the Tourism Bureau has continued to devote itself to international promotion and marketing to enhance international visibility. For example, in the Japanese market, the actor Masami Nagasawa, who is loved by the Japanese people, was chosen to shoot an international promotional video for the Taiwanese tourism spokesperson in Japan. In 2017, in order to sprint the European market, the Director of Tourism Bureau led a delegation to the United Kingdom to participate in the London Travel

Fair and organize promotional activities. In addition, the official website of the Tourism Bureau has done a very good job in promoting tourism of Taiwan. The homepage of the website contains 11 columns such as tourism news, pre-departure planning and exploring Taiwan. Each column has a specific branch that introduces each scenic spot in detail, as well as information about transportation, accommodation, food, and shopping around the scenic spot. The well-made and well-publicized official tourism website not only provides itinerary guidance for inbound tourists and enhances the sense of travel experience, but also inspires potential inbound tourists.

4.4 The Development Strategy of Tourism Product

At present, there are more than 100 kinds of tourism products in Taiwan. In recent years, it has been developed to create food tours, cultural tours, hot spring tours, romantic tours, Lohas tours, outlying island tours, ecological tours, railway tours, and night market tours, hometown tours, silver-haired people's tours, barrier-free tours, and other unique tourism products, attracting travel enthusiasts from all over the world. In addition, it has also developed ten theme amusement parks. Among them, Kaohsiung E-DA World is Taiwan's largest and most complete new landmark for leisure, sightseeing, shopping and amusement. The famous Yangmingshan, Beitou, Guanziling and Sichongxi hot springs are available for inbound tourists to soak and recuperate. The dazzling array of department stores and shopping malls, and the 24-hour Eslite Bookstore all make inbound tourists come to visit.

4.5 The Participation of the Taiwan Provincial Government

The Taiwan Provincial Government has been actively participating in the development of local inbound tourism for many years. Around 1970, internationally renowned experts were invited to Taiwan to inspect tourism resources and scientifically plan the development of the tourism industry. In recent years, a number of policies and measures on tourism development have been formulated. In June 2008, Taiwan and the mainland signed the "Agreement on Mainland Residents Traveling to Taiwan on Both Sides of the Strait". The signing of this agreement provides more possibilities for mainland residents to travel to Taiwan, thus stimulating Taiwan's inbound tourism market [16]. On June 28, 2011, mainland residents went to Taiwan for personal tourism. So far, 47 mainland cities have been opened in five batches. In 2016, in order to attract more inbound tourists and shape the image of a shopping island, Taiwan began to implement a tax refund system for foreign tourists. On January 4, 2018, Taiwan formulated the "Taiwan Sustainable Tourism Development Plan (2017-2020)", aiming to make Taiwan a major tourist destination in Asia that is friendly, smart and experienced.

5. ENLIGHTENMENT TO HAINAN'S INBOUND TOURISM DEVELOPMENT

5.1 Improve Hainan's Tourism Infrastructure Construction

Increase the air routes between Hainan and the main source of inbound tourism, improve the existing airport facilities in Hainan, and make preparations for the construction of the new airport [17]. Improve the transportation service between railway stations and major sightseeing spots, and change the lack of public transportation in cities and counties, and solve the inconvenience encountered by tourists in transportation. Promote Budget hotel chain operations, encourage the development of family hotels or homestays with cultural characteristics, and provide diversified accommodation options for inbound tourists. Lead hotel industry talents to Taiwan to explore the entire process of planning and development of Taiwan's homestay industry. Learn advanced experience to help Hainan build boutique homestays and realize the diversification of tourist accommodation options. Increase the construction of duty-free shopping malls, build characteristic ocean parks, water parks, etc., and improve the construction of tourism and entertainment facilities in Hainan.

5.2 Improve the Overall Quality of Hainan's Tourism Employees

Based on the low overall quality of Hainan's tourism staff and the extreme shortage of international tourism talents, Hainan province must concentrate on improving the overall quality of local tourism staff. The provincial government has improved the industry norms and codes of conduct for tourism practitioners, and focused on increasing the supervision of tourism services in the tourism industry, such as strengthening the management and optimization of the tour guide certification system. Local tourism colleges in Hainan should strengthen the supervision of student's cultivation and assessment of professional ethics, professional knowledge, foreign language ability, etc., strengthen school-enterprise cooperation, and deliver high-quality talents for the tourism industry. Tourism companies actively organize employee learning conferences, continue to introduce advanced management thinking at home and abroad, as well as high-quality talent training concepts and methods, and

cultivate high-quality tourism professionals with foreign-related tourism service capabilities. Tourism practitioners should be strict with themselves, continuously strengthen and consolidate professional knowledge and skills, cultivate a high sense of responsibility, and consciously strengthen and enhance service awareness.

5.3 Intensify the Promotion of Tourist Destinations

Hainan must keep up with the pace of the times, make use of Internet functions, enrich publicity methods, and increase the visibility of tourist destinations. And it should find the accurate positioning of the province and create a distinctive brand image. First of all, the Hainan Provincial Government should increase its investment in tourism promotion and marketing to lay a solid economic foundation for Hainan's tourism promotion. Secondly, the government should improve the tourism publicity mechanism, optimize the official network platform of the Tourism Commission, supervise the progress of the publicity work, and check the results in time. Use self-media, social software and mobile terminal for online promotion. Strengthen closer cooperation with online travel agencies, take the initiative to launch Hainan tourism products, and increase the exposure of Hainan tourism destinations on the Internet, so as to shape hainan's unique brand culture and enhance its influence. Make an in-depth investigation of the source country market and adopting different promotional strategies in different major source country markets.

5.4 Develop Distinctive Tourism Products in Depth

Hainan Province has a vast territory and abundant tourism resources, but its utilization efficiency and development level of tourism resources are not very high. Hainan relies on coastal resources to develop tourism products, and its tourism products are single and lack diversity. In order to improve the development level of Hainan's inbound tourism, it must deeply develop distinctive tourism products. Develop cultural and sports tourism, carry forward the folk culture characteristics of Hainan minorities, and constantly expand the scale and influence of the traditional festival of Hainan Li and Miao nationalities. Develop cruise tourism and promote the opening of transnational cruise routes and "Pan-South China Sea" cruise routes between Hainan and the countries along the "21st Century Maritime Silk Road". Develop healthy tourism, build a number of ecological health service bases in Haikou, Sanya and Danzhou, and optimize the structure of healthy tourism products. Continue to develop and improve exhibition tourism, rural tourism, forest ecological tourism, characteristic town tourism, shopping tourism and other tourism products.

5.5 Increase Government Participation and Seize Policy Opportunities

The Hainan Provincial Government should formulate a more open and flexible policy system for tourist entry. According to information released by the National Immigration Administration, the visa-free policy for tourists from 59 countries has been implemented in Hainan province since May 1, 2018, which helps attract more international tourists to the island. Try to establish sister cities with internationally renowned cities and sign cooperation agreements, especially reciprocal agreements on inbound and outbound tourism. Actively go to international sister cities to participate in or carry out tourism exhibitions, and continuously enhance the international reputation and influence of Hainan tourism brands. Firmly seize the policy opportunity and adopt rapid and effective development measures. The "Guiding Opinions on Supporting Hainan's Comprehensive Deepening of Reform and Opening-up" issued by the State Council in April 2018 encourage Hainan to develop horse racing and other projects, and explore the development of quiz-type sports lottery and large-scale international competition instant lottery. The Hainan government should seize this opportunity in a timely manner, rationally explore the development of the gaming industry, attract more inbound tourists, and earn a lot of foreign exchange.

6. CONCLUSION

The key factors of refractory industry from big to strong and from strong to new are talents and education. In this paper, the present situation of professional and technical personnel in refractory enterprises is investigated from multiple perspectives, and some countermeasures and suggestions are put forward for the shortage of skilled personnel in refractory industry.

REFERENCES

- [1] Li Hongxia. Development of refractory Materials [J]. Journal of inorganic materials, 2018, 33(2):198-205.
- [2] Li Tingshou, WANG Zetian. the development process, Progress and new development of Low-carbon transformation of China's refractory industry -- In commemoration of the 100th anniversary of academician Zhong Xiangchong's birth [J]. Refractory Materials, 201, 55(05):369-380.
- [3] Hu Naimin. Status and Development of Refractory Intelligent Manufacturing [J]. Refractory Materials, 201, 55(06):545-548.
- [4] Wang Zhongya. Research on the high quality development of new material industry in Henan Province [J]. Cooperative Economics and Science and Technology, 2021, (18):46-47.
- [5] Zhou Xiaolei. Reflection on realizing high quality development of Magnesium refractory industry in Liaoning province [J]. Refractory and Lime, 201, 46(03):14-16+21.
- [6] Peng Jinhua. Consideration on talent team construction of Magnesium industry in Yingkou city [J]. our country Metal Bulletin, 2020, (07):238-239.
- [7] Si Zhiguo. Analysis on the reasons and countermeasures of difficulties in recruiting agriculture- related majors in higher vocational colleges [J]. Henan Agriculture, 2013(8):9-10.
- [8] Zhang Ying, Wu Zhande, Liu Guowei, Song Qiang. Teaching reform of process design in refractory material factory [J]. Metallurgical Education of our country, 2021(03):80-81.
- [9] Zhao Yan, Lei Hong. Exploration on Teaching Methods of Refractory Materials [J]. Metallurgical Education of our country, 2019, (03):12-13.
- [10] Han Jingxin. Research on the Construction path of vocational Education Textbooks from the action-oriented perspective [J]. our country Adult Education, 2022, (02):46-48.
- [11] Zhao Yuanyuan. Research on cultivation Path of "Double-qualified" Teachers in Higher Vocational Colleges under the Background of industry-Education Integration [J]. Contemporary Agricultural Machinery, 2021, (12):61-62.