

Path Analysis of Higher Education Promoting the Construction of the Hainan Free Trade Port

Chen Lin
Qiongtai Normal University
Haikou 571100,
People's Republic of China

Jianmeng Ou
School of Education, Tianjin
University, Tianjin 300072
People's Republic of China

Dongdong Lin
School of Economics, Hainan
University, Haikou 570228
People's Republic of China

Abstract: In June 2019, the Ministry of Education and the Hainan Provincial Government jointly issued the Implementation Plan on Supporting Hainan to Deepen Education Reform and Opening Up. It clearly proposed to support Hainan to build an international education innovation island and create a new benchmark for China's education opening up and development in the new era, which pointed out the direction and injected new momentum for the opening up and leapfrog development of Hainan's higher education to the outside world. From the perspective of theoretical traceability and practical foundation, this paper finds that the current higher education in Hainan Province has some problems. The regional layout needs to be further optimized and the depth of integration with key industrial parks is not deep enough. Some institutions have lagged behind in setting and adjusting their majors and some majors are not outstanding and the effectiveness of talent training needs to be further improved, etc. In order to promote the construction of the Hainan Free Trade Port with the development of higher education, the paper proposes four specific paths based on whether the potential demand can be predicted and whether the specific real demand is regular in the construction of the Hainan Free Trade Port.

Keywords: higher education; Free Trade Port; demand; path

1. INTRODUCTION

General Secretary Xi Jinping announced on April 13, 2018, at a celebration celebrating the 30th anniversary of the establishment of Hainan as a special economic zone, that "supporting Hainan in constructing a pilot free trade zone on the whole island, and in gradually exploring and steadily promoting the construction of a free trade port with Chinese characteristics." The subsequent release of the Guiding Opinions of the CPC Central Committee and the State Council on Supporting Hainan in Comprehensively Deepening Reform and Opening Up outlines a grand blueprint for the construction of Hainan's Free Trade Port and comprehensive deepening of reform. The specific guiding lines are proposed in "guiding ideology, strategic positioning, basic principles, development goals, building a modern economic system, promoting the formation of a new comprehensive opening-up pattern, innovating institutional mechanisms to promote the construction of an international tourism consumption center, serving and integrating into major national strategies, strengthening and innovating social governance, accelerating the reform of the ecological civilization system, improving the talent development system, and guaranteeing measures [Central People's Government of the People's Republic of China. Guiding Opinions of the CPC Central Committee and the State Council on Supporting Hainan in Comprehensively Deepening Reform and Opening Up. [EB/OL]. [2018-4-14]. http://www.gov.cn/zhengce/2018-04/14/content_5282456.html]. The introduction of the guidance marks the continuous promotion of China's comprehensive reform and opening up and the full-scale opening of the construction of the Free Trade Port in Hainan Province. National major strategic projects such as Belt and Road, International Tourism Island, and Free Trade Port construction provide important policy opportunities and external environment for the development of higher education in Hainan Province. In June 2019, the Ministry of Education and the Hainan Provincial Government jointly issued the Implementation Plan on Supporting Hainan to Deepen Education Reform and Opening Up. They clearly propose to support Hainan in building an international education

innovation island and create a new benchmark for China's education opening up and development in the new era, which points out the direction and injects new momentum for the opening up and the leapfrog development of Hainan's higher education to the outside world.

From the existing studies, the impact of higher education development is multifaceted, including adjusting the local industrial structure, improving economic structure, and promoting opening up to the outside world. Jiaqi Wu (2022) found that higher education can not only promote the transformation and upgrading of industrial structure from primary to secondary and tertiary industries, but also promote the internal upgrading of each sub-industry. Zhongjing Liu (2022) concluded that the benign and mutually reinforcing dynamic relationship between industrial structure and higher education structure has not been fully formed, and the promotion and leading role of higher education discipline structure on the industrial structure are not strong and there is a lag. Xinxin Xue (2022) studied the degree of coupling and coordination between education structure and industrial structure in three regions of Beijing, Tianjin and Hebei by establishing a coupling model, and got the highest degree of coordination in Beijing, followed by Tianjin and the weakest in Hebei. In addition to the regional differences, the temporal differences in higher education on industrial structure are also significant. Xiling Cheng (2021) obtained that higher education has a positive effect on the adjustment of industrial structure rationalization, but it is not prominent in the early period. In the long term, the contribution of higher education to the rationalization of industrial structure maintains a continuous rise with long-term stability. In terms of improving economic structure, most scholars believe that higher education has a close relationship with the transformation and upgrading of economic structure. Long Wang (2016) believes that the transformation and upgrading of higher education are closely related to the economic structure, on the one hand, higher education can promote the transformation and upgrading of the economic structure, on the other hand, the successful transformation of the economic structure can provide economic support for the long-term

development of higher education. Chun Tian (2021) argued the relationship between the hierarchical structure of higher education and economic structure by empirical analysis and concluded that the hierarchical structure of higher education is significantly and positively correlated with the economic structure, and the impact brought by the change of economic structure on the hierarchical structure is significantly greater than that brought by the change of hierarchical structure on the economic structure. Jun Wang (2021) constructed a comprehensive evaluation model of the coupled synergy level of local higher education and regional economic transformation and upgrading, which obtained that there is a high level of synergy development between local higher education and economic structural transformation and upgrading in Guangdong Province.

The academic community is also rich in research on the influence path of higher education on local economic development. Yifan Zhang(2019) argued that higher education can influence economic development in various ways, such as improving human capital, boosting urban consumption, and driving innovation and entrepreneurship. Higher education is regarded as the core of human capital formation, and Yangxi Liu (2014) obtained through empirical analysis that higher education development has a high positive correlation with regional economic development, but geographical location factors affect the strength of the positive correlation. The contribution of higher education to economic growth is most significant in Beijing, Tianjin and the eastern coastal region, followed by the central region and the lowest in the western region. Junpeng Di (2014) divided economic output into three major industrial outputs and found that higher education had different degrees of impact on different industries by analyzing the impact of higher education on the output of industry, agriculture and services. That is, higher education has the largest impact on the industrial sector, a statistically insignificant impact on the agricultural sector, and a significant positive effect on the output of the service sector. Peng Deng (2016) established a multiple regression model and found that higher vocational education resources across Xinjiang, both in terms of school distribution and the number of students trained, contributed to local economic development. The education and training of engineering, however, contributed to the development of secondary industry industries in each region, but the overall effect on graduates, enrollment, and the size of school students was not significant. Rui Mao (2013) believed that local higher education provides regional economic and social development by providing talent support, scientific and technological support, and by setting up higher education disciplines and specialties. It can meet the demand of regional economic restructuring, industrial upgrading, and social career development for various talents, and provide strong talents as well as scientific and technological guarantees for regional economic construction and social development.

The studies on free trade zones and the construction of free trade ports have mostly focused on analyzing different aspects such as finance, policy, law, trade environment and openness in the development process of free trade zone and free trade port construction. Meng Li (2017)[Meng Li, Management Innovation in Free Trade Zones: Lessons from Overseas Experience, Open Guide, No. 1, 2017, p. 75.] studied the innovation of the management system of China's free trade zones and proposed that improvements should be made in specific management modes and investment methods by drawing on advanced foreign experience. Yiwen Ling (2018) believed that due to the complexity of the international

economic environment, China has formed the "1+3+7" free trade zone pattern[Yiwen Ling, Bottlenecks Facing the Construction of Free Trade Zone and the Way Forward, Journal of Xinjiang Normal University (Philosophy and Social Science Edition), No. 6, 2018, p. 146.], and the existing free trade zones in China face bottlenecks in the development process such as lagging domestic supporting policies and trade protectionism. To break through the development bottlenecks, we should further rationalize the planning of development goals, promote industrial upgrading, optimize the construction of free trade zones in inland areas, and introduce effective supporting policies. Xiaolu Cao et al. (2018) argued that in the process of national efforts to build the free trade zone and free trade port in Hainan, a series of commercial disputes will arise that need to be resolved by introducing new mechanisms promptly, and should draw on the advanced experience of international free trade ports such as Hong Kong and Singapore to introduce dispute resolution mechanisms such as "temporary arbitration"[Xiaolu Cao and Chongmin Wang, Research on the innovation of temporary arbitration mechanism for the construction of free trade port in Hainan, Journal of Hainan University (Humanities and Social Sciences Edition), Vol. 3, 2018, p. 2.]. Guoqiang Ma et al. (2018) analyzed the financial environment of Hainan's Free Trade Port and found that the financial environment of Hainan Province is facing the problems of "not rich in financial types and few financial institutions"[Guoqiang Ma, Xiaotong Zhao, Analysis of the Financial Environment for Building a Free Trade Port in Hainan with Chinese Characteristics, Journal of Hainan University (Humanities and Social Sciences Edition), Vol. 6, No. 6, 2018, p. 27.]. And to optimize the financial environment of Hainan's Free Trade Port, it is necessary to further innovate the management mechanism in the financial field, and create a relaxed environment for regional capital flow. Learning from the advanced foreign experience, using advanced intelligent information systems, and relying on big data technology to realize the intelligence of the financial environment can promote the better and faster development of the Hainan Free Trade Port. Peng Sun et al. (2018) measured the "openness" of Hainan Province since its construction and constructed a specific index system of openness[Peng Sun, Wenli He, Shijie Li, Measurement of Hainan's external openness since the establishment of the province and comparison with other special economic zones - and policy recommendations for building a free trade port with Chinese characteristics in Hainan, Journal of Hainan University (Humanities and Social Sciences Edition), Vol. 6, No. 6, 2018, p. 8.]. They measured the degree of openness of Hainan Province in the past 30 years by using the entropy algorithm, and compared it with other regions in China, identifying specific gaps and fields that should be optimized. Tianbao Qin (2018) believed that the construction of the Free Trade Port in Hainan Province should focus on the relationship between the environment and trade. There are different views on the relationship between the two in theory[Tianbao Qin, Environmental Regulation in the Construction and Development of Free Trade Port, Journal of Hainan University (Humanities and Social Sciences Edition), Vol. 3, No. 3, 2018, p. 13.]. To handle the relationship between the two in practice, it should be improved from different aspects such as legislation, access conditions and dispute settlement mechanism.

In summary, it can be seen that few existing studies have analyzed the human resources and educational foundation of the construction of free trade zones and free trade ports, and especially little attention has been paid to how higher

education contributes to the construction of free trade zones and free trade ports. As the largest Free Trade Port in China, Hainan's higher education foundation is very weak. How to create and establish a new benchmark for comprehensive reform and opening up of higher education in the new era under the overall deployment of the Hainan Free Trade Port to help it develop? How to explore the feasible path to establish the synergistic development of higher education and economic society? These are all questions that must be answered for the construction of the Hainan Free Trade Port. Therefore, this study will take Hainan Province as an example to specifically analyze the basic path of higher education to facilitate the construction of a Free Trade Port.

2. Theoretical traceability and practical basis of high education to promote the construction of the Hainan Free Trade Port

2.1 Theoretical traceability

According to the analysis of system science, in the large system of society, there exist political, economic, cultural and educational subsystems (Figure 1). These subsystems interact and influence each other, and the education system will also influence other social subsystems and be influenced by other subsystems such as politics, economy, and culture. The "law of external relations in education[Maoyuan Pan, Wei Lian Wang, Higher Education, Fuzhou: Fujian Education Press 2013, p. 31.]" means that the various activities of the educational system have an inevitable interaction with the social system and its subsystems. The law of external relations in education determines that the development of education must be adapted to the development of the social economy. That is, on the one hand, the activities of education will be restricted by the economic, political and cultural development of the social system; on the other hand, the development of education must contribute to and continuously promote the economic, political and cultural development of the society. Being restricted is the premise, functioning is the purpose, and only under the specific laws governing education can better play its social function. The ongoing construction of the Hainan Free Trade Port will be constrained by the economic, political and cultural factors in Hainan Province and the country as a whole, and also requires higher education in Hainan Province to play an important role in the process of construction of Hainan Free Trade Port.

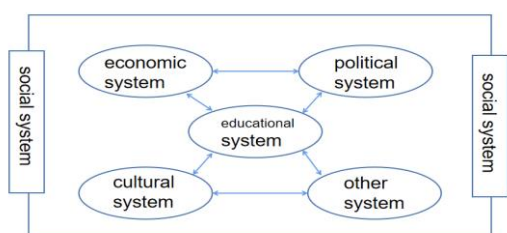


Figure. 1 Relationship between social system and other subsystems

Any social organization must respond to social needs in order to arise and exist. According to the famous American sociologist Brubacher, there are two main ways to establish the existence of a university, which are based on epistemology and political theory—two philosophies of higher education. From the philosophical basis of Brubaker's higher education existence, we can get that the existence of the university is and "ivory tower" or "social service station"[Jun Li, Yafeng Song, A Re-examination of the Purpose of Social and Personal Ontology Education, Educational Theory and

Practice, No. 10, 2017, p. 3.]. Higher education based on epistemology emphasizes the advanced study with idle curiosity and aims at knowledge production with concise theory, useful explanation, elegant concepts and rigorous logic. With the development of the social economy, universities had to come out of the ivory tower and began to gradually adapt and meet the increasingly rich social needs. For example, in the mid-19th century, the strong social demand created many multidisciplinary technical colleges in the United States[John S. Brubaker, On the Philosophy of Higher Education, Hangzhou: Zhejiang Education Press 1987, p. 15.], such as Rensselaer Polytechnic Institute, Lawrence College of Science, The College of Science of Sheffield, etc. Later, during the Civil War, the Morell Act prompted the emergence of agricultural and industrial colleges in various states of the United States. As time went by, the connection between higher education and social needs has become closer and closer, and the social service function of universities has gradually received the attention of society. The relationship between liberal education and professional education is not completely opposed, and the synergistic development of the two should become more important to our attention. Problems in the fields of government, business, agriculture, raw materials, international relations, education, health, etc., which could be solved by experience before, now require extremely profound knowledge, especially in the present era of knowledge explosion and rapid development of Internet technology, where knowledge is more rapidly differentiated and updated, and the best place to acquire knowledge and talents to solve the above-mentioned problems is in higher education institutions. This suggests that the construction of the Free Trade Port in Hainan Province needs different levels and types of professionals. These professionals can be acquired from talents trained by higher education in Hainan Province. The development of higher education in Hainan Province will also play an increasingly important role in the construction of the Hainan Free Trade Port.

2.2 Practical foundation

Looking at the number of colleges and universities in Hainan Province in the past 20 years, the number shows an obvious growth trend in colleges and universities setting from 1998 to 2020 (Figure 2), from 5 in 1998 to 20 in 2020, which has increased by four times and which has increased most rapidly in the context of higher education expansion at the end of the 20th century. The growing higher education institutions provide an important guarantee for the supply of talents and social services for the construction of the Free Trade Port in Hainan.

Higher education students are the main source of regional human resources. From the situation of higher education students in Hainan Province (Table 1), from 2008 to 2020, the number of students in regular institutions of higher learning, university undergraduate students in regular institutions of higher learning, junior college students in regular institutions of higher learning, university students graduated (completed) in regular institutions of higher learning, junior college students graduated (completed) in regular institutions of higher learning, etc. have basically shown a growing trend in the past 20 years. The increasing number of higher education students has laid a solid talent reserve for the construction of the Free Trade Port in Hainan Province.

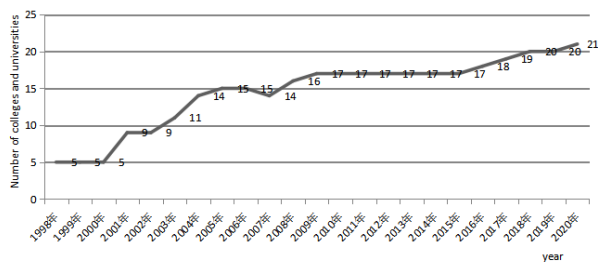


Figure. 1 Relationship between social syste

Table 1 Overview of higher education students in Hainan Province Unit: 10,000

Year	Enrollment number of regular institutions of higher learning	Undergraduate enrollment number of regular institutions of higher learning	Number of junior college enrollment at regular institutions of higher learning	Number of students in regular institutions of higher learning	Number of university undergraduate students in regular institutions of higher learning	Number of junior college students in regular institutions of higher learning	Number of students graduated (completed) in regular institutions of higher learning	Number of university students graduated (completed) in regular institutions of higher learning	Number of junior college students graduated (completed) in regular institutions of higher learning
2008	3.97	1.81	2.16	12.64	6.10	6.54	2.34	0.84	1.50
2009	4.64	2.13	2.51	14.21	7.01	7.20	3.08	1.06	2.02
2010	4.76	2.50	2.26	15.08	8.03	7.05	3.68	1.38	2.30
2011	4.64	2.40	2.24	15.67	8.79	6.88	3.92	1.58	2.33
2012	4.96	2.61	2.35	16.83	9.79	7.04	4.09	1.80	2.29
2013	4.93	2.57	2.36	17.21	10.30	6.92	4.38	2.00	2.38
2014	5.45	2.60	2.85	18.06	10.47	7.59	4.48	2.35	2.13
2015	5.24	2.70	2.55	18.29	10.60	7.70	4.82	2.50	2.32
2016	5.32	2.80	2.52	18.49	10.77	7.72	4.87	2.53	2.34
2017	5.22	2.80	2.41	18.55	11.04	7.52	5.04	2.49	2.55
2018	5.45	2.92	6.87	3.15	3.72	23.01	12.57	10.44	5.56
2019	6.86	3.12	6.86	3.12	3.74	20.74	11.87	8.87	5.28
2020	6.87	3.15	5.45	2.92	2.53	18.92	11.4	7.51	5.29

From the major settings of higher education institutions in Hainan Province (Table 2), there are multiple majors and the advantages of popular majors and characteristic disciplines are obvious. The popular majors are: English, tourism management, hotel management, marketing, financial management, computer science and technology, software engineering, law, international economics and trade, Chinese language and literature, logistics management, e-commerce,

etc. The major layout of higher education institutions in Hainan province is diverse, with prominent hotspots and distinct characteristics, which can provide professionals of all levels and types for the construction of the Hainan Free Trade Port. Among them, language majors and tourism and hotel management majors are the most set categories of majors in Hainan's colleges and universities, laying a good human resource reserve for the acquisition of translation talents and management teams during the construction of Hainan's Free Trade Port.

Table 2 Popular majors in higher education institutions in Hainan Province (top30)

undergraduate program					college major				
order number	name	frequency	order	name	frequency	order	name	frequency	order

number		cy	number		cy	number		u	nu		u
								en	um		en
								cy	ber		cy
1	English	10	16	HRM	4	1	tourism management	13	16	International cruise crew	5
2	tourism management	8	17	Japanese	4	2	accounting	12	17	HRM	5
3	hotel management	7	18	Exhibition economic management	4	3	hotel management	12	18	computer application technology	4
4	marketing management	6	19	communication engineering	4	4	Electronic Commerce	10	19	Automotive Marketing and Services	4
5	financial management	6	20	bio-science	4	5	marketing management	9	20	art layout	4
6	Computer Science and Technology	6	21	applied psychology	4	6	Computer Network Technology	7	21	secretary	3
7	software engineering	6	22	Visual communication design	4	7	Aircrew	7	22	Sports Operation and Management	3
8	law	5	23	physical education	4	8	Environmental Art Design	6	23	software technique	3
9	international economics and trade	5	24	Clothing design	4	9	Cooking technology and nutrition	6	24	Civil aviation transportation	3
10	Chinese Linguistic Literature	5	25	Dance	4	10	Automobile detection and maintenance technology	6	25	Civil aviation safety technology	3
11	physical distribution management	5	26	business administration	3	11	Mobile communication technology	5	26	Food nutrition and testing	3
12	Electronic Commerce	5	27	Ideological and political education	3	12	construction cost	5	27	Applying Russian	3
13	preschool education	5	28	Chinese International Education	3	13	Construction engineering technology	5	28	Electrical automation technology	3
14	musical performance	5	29	Engineering management	3	14	financial management	5	29	Architectural decoration engineering technology	3
15	accounting	4	30	Electrical & Information Engineering	3	15	physical distribution management	5	30	Real estate operation and management	2

3. Case analysis of the promotion of higher education to the construction of the Hainan Free Trade Port

The continuous development of higher education in Hainan Province provides strong intellectual support and talent guarantee for the construction of the Hainan Free Trade Port. The growing number of colleges and universities, the number of students, and a complete range of colleges and universities with prominent characteristics of the professional setting, all provide a variety of possibilities for Hainan's higher education

to play an important role in the construction of the Hainan Free Trade Port. At the same time, there are some problems in the promotion of Hainan higher education to the construction of the Hainan Free Trade Port. In order to make higher education better and promote the construction of the Hainan Free Trade Port, we should make a comprehensive analysis of the existing problems of higher education in Hainan Province. According to the current development of Hainan higher education, the main problems of higher education to promote the construction of the Hainan Free Trade Port can be attributed to the following aspects.

(a) The regional layout of higher education needs to be further optimized, and the depth of integration and development with key industrial parks is not enough.

Higher education institutions in Hainan Province are concentrated in Haikou and Sanya, basically in the old centers, where the development space has reached great limitations and there is a very strong demand for the construction of new campuses. Except for Hainan University, which is a multi-campus formed by the historical reason of merging two universities, Hainan Normal University, Qiongtai Normal College and Hainan Tropical Ocean College are mainly new campuses built because of the space limitation of the old campuses. The concentration of colleges and universities in both Guilinyang(Haikou) and Lizhigou(Sanya) is also not enough. University Town of GUILINYANG has been under construction since 2005, but there have been only 4 higher education institutions so far; Sanya Lizhigou Education Park was not planned as a college area from the beginning, which was formed naturally, but it is located in the downtown area and the available construction land is already very limited. The implementation scope of the Hainan Free Trade Port covers the whole island. There are eleven key industrial parks—Hainan Free Trade Port Yangpu Economic Development Zone, Hainan Free Trade Port Boao Lecheng Pilot Zone of International Medical Tourism, Hainan Free Trade Port Haikou Jiangdong New Area, Hainan Free Trade Port Haikou National High-tech Industrial Development Zone, Hainan Free Trade Port Lingshui Li'an International Education Innovation Pilot Zone, Hainan Free Trade Port Wenchang International Space City, Hainan Free Trade Port Sanya Central Business District, Hainan Free Trade Port Haikou Fulling Internet Information Industrial Park, Hainan Free Trade Port Haikou Comprehensive Bonded Area, Hainan Free Trade Port Sanya Yazhou Bay Science and Technology City, Hainan Free Trade Port Ecological Software Park. But limited by historical reasons, the layout of universities and colleges in Hainan Province is not enough combined with industrial parks, and no university is located in the main industrial parks.

(b) There is a lag in the major setting and adjustment of some high education institutions.

The untimely setting and adjustment of majors in some colleges and universities in Hainan Province are one of the limiting factors for higher education in Hainan Province to help the construction of the Hainan Free Trade Port. Majors are different specialized fields of knowledge composed of courses according to academic or vocational disciplines, which is a form of curriculum and an important carrier for talents trained in colleges and universities. Through the statistical analysis of the major settings of 19 higher education institutions in Hainan Province in the past 5 years, it is found that there is a serious lag in the major setting and adjustment of some colleges and universities. A zero tariff system for island-wide customs operation is expected in Hainan Province in 2025, making it open to international goods at the first line, strengthening supervision over imported goods at the second line, and vitalizing free trade in the whole island. All kinds of trade generated in this process is an important form of an international free trade port. However, the major setting of higher education in Hainan lags behind seriously, which can't solve the problem of trade-related talent shortages in Hainan Free Trade Port in the future. Take the major of International Economics and Trade at Hainan University as an example, its major setting only includes international business law, international trade insurance and financing, international trade

practice and other theoretical courses. The teaching process stays at the level of theoretical analysis, and does not set up other trade courses with Free Trade Port characteristics, like Free Trade Port business environment, offshore trade and so on. And due to the lack of international trade sandbox simulation and other experimental courses, students can not deduce the actual Free Trade Port transaction process, making students lack recognition towards importers and exporters, import and export banks in the learning process. The lag of major settings makes it difficult for colleges and universities to make timely predictions and responses to the changes in industries and talents needed in the context of the rapid development of Free Trade Port, which makes it difficult for the talents cultivated by colleges and universities to better adapt to new industries and the changing needs. The obvious "hindsight" in the setting of majors is a prominent problem in the process of high education to promote the construction of the Hainan Free Trade Port. In addition, the adjustment of some outdated majors set by some colleges and universities in Hainan Province is not timely enough. Through the analysis of the enrollment prospectus of colleges and universities in Hainan Province in the past 5 years, it is found that some colleges and universities have not adjusted too much to some majors that obviously cannot adapt to the needs of industry, and there is obvious path dependence. The lag of setting up new majors and the untimely adjustment of "outdated" majors make it difficult to adapt the talents cultivated by higher education in Hainan Province to the development demands of industry and economy, which will also limit the role of higher education institutions at all levels in the construction of Hainan Free Trade Port.

(c) Features of some majors are not outstanding

Although the number and types of majors in higher education institutions in Hainan Province are relatively complete, their regional characteristics and institutional characteristics are not very prominent. Through a statistical analysis of major settings in present higher education institutions in Hainan Province, it is found that there is no distinct difference in major settings regarding leading fields, research direction and distribution of popular majors between Hainan and other provinces. Characteristics are a unique style or traits shown by a certain object in a certain time and space. Institutional characteristics and professional characteristics mean the competitiveness and lasting vitality of the development of colleges and universities. The development of characteristics is the core of quality and high-level of higher education, and it is also the choice of every higher education institution in the process of formulating the development strategy of the institution. However, by analyzing the major setting and talent cultivation mode of the existing higher education institutions in Hainan Province, we can find that the so-called characteristics of some institutions are more formal ones at the level of propaganda, and the concept of characteristics is not really integrated into the whole process of institutional development and talent training. Some institutions are even in short of majors with regional characteristics or these kinds of majors are in a poor educational situations, which will limit the high level and rapid development of higher education in Hainan Province. The unique climate, geographical location, history and culture of Hainan Province provide many advantages for the development of higher education in Hainan Province, and also provide diversified choices for the setting of majors in Hainan higher education institutions. On April 14, 2018, the State Council put forward Guiding Opinions of the CPC Central Committee and the State Council on Supporting Hainan in Comprehensively Deepening Reform

and Opening Up, which mentions that it is necessary to promote the transformation and upgrading of tourism and accelerate the framing of the characteristic tourism industry system. As a tropical island, Hainan has many types of distinctive cultures such as Li culture, tropical marine culture, and Southeast Asian architecture culture. However, taking the Hospitality Institute of Sanya as an example, its tourism management-related major only offers the basic courses of tourism marketing, electronic commerce and so on, but did not involve the study of Hainan's special culture, lacking Hainan's local special resources. At the same time, due to the unique geographical advantage of Hainan Island located in Southeast Asia and the policy of visa-free entry into the Hainan Free Trade Port, the number of foreign tourists continues to climb. However, due to the existing hotel management and tourism management industry talents mostly from vocational education, the educational level is poor. Cultural education is neglected in major settings which leads the employees cannot provide quality service to tourists in terms of language communication, especially English communication, and domestic and foreign cultural differences. In order to better promote the construction of the Hainan Free Trade Port, the higher education institutions in Hainan Province should actively echo the actual needs of Hainan Free Trade Port construction in the major setting, and deeply develop the institutional and professional characteristics of the higher education institutions in the province.

(4) The effectiveness of talent cultivation should be further improved

Whether the type and quantity of major settings in the existing institutions of higher education in Hainan Province are closely related to the needs of the industrial and economic development will directly affect the pertinence of major settings, and the lack of pertinence of majors will further affect the effectiveness of talent training. Through the analysis of the talents training of the existing institutions of higher education in Hainan Province and the development needs of the industrial economy of Hainan Province, it is found that there is still much room for improving the pertinence of major settings and the effectiveness of the talent training. The establishment of training objectives for different majors is an extremely complicated process, which must go through extensive research and strict argumentation. The establishment of training objectives is the interaction between the subjective factors such as educational philosophy, school ideology and education concept of the higher education institutions and the objective factors such as social productivity, economic and political system and science and technology development level. Irrational major setting and training objectives will affect the raise in effectiveness and scientificity of talent training in higher education institutions. At present, the construction of the Hainan Free Trade Port needs international talents. The enterprises generally reflect that the urgent shortage of talents mainly includes three types, namely, high-end talents with innovation ability in the industry, communication talents who are familiar with international rules and cultural differences, and trade talents who are familiar with the capital operation and business rules. But from the current situation, the internationalization level of Hainan higher education is low, the province is in short of international talent training. Take Hainan University as an example, which has a high level of internationalization in Hainan higher education. There are only 3 Chinese and foreign talent training programs and only 5 overseas internship programs. The number of programs is limited, and

only a narrow range of students can benefit from these programs. In addition, the school platform support is insufficient. At the same time, some universities in Hainan Province also enroll some majors for junior colleges, which is obviously "incompatible" with the development orientation of the school, the pertinence of major settings, and the enhancement of the effectiveness of talent training. The existence of these phenomena will further restrict Hainan's higher education to effectively meet the real talent demand for the construction of the Hainan Free Trade Port.

4. Path analysis of promoting higher education to serve the construction of the Hainan Free Trade Port

The development of higher education in Hainan Province plays an increasingly important role in the construction of the Hainan Free Trade Port. In order to make higher education institutions in Hainan Province better promote the construction of the Hainan Free Trade Port, it is necessary to further clarify the problems that exist in the process of higher education institutions serving the industrial and economic development of Hainan Province. Based on overcoming the existing problems, we should optimize and improve the specific path of higher education in Hainan to promote the construction of the Hainan Free Trade Port. The key for Hainan higher education to promote the construction of the Hainan Free Trade Port is to effectively meet the various demands in the process of Free Trade Port construction. Based on two dimensions in the construction process of the Hainan Free Trade port: 1. whether the potential demand can be predicted; 2. whether the specific actual demand is conventional, the path of Hainan higher education to promote the construction of Free Trade Port can be illustrated as the following matrix. (Figure 3).

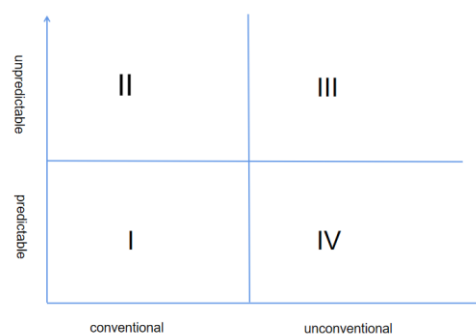


Figure. 1 Framework for analyzing the specific paths of higher education in Hainan Province to promote the construction of the Free Trade Port

Path I: It is the path chosen mainly in the process of the construction of the Free Trade Port in Hainan where the actual demand is the conventional demand and the potential demand is the predictable demand, and it is a path where Hainan higher education is most likely to play its main role with the least difficulty of effective promotion. Philosophy of higher education oriented by political theory believes that higher education will play a more and more important role in the development of social economy and assume more and more important social functions, including talent training, scientific research, social services and cultural heritage. The predictable potential demand and the stable conventional demand in the process of the construction of the Hainan Free Trade Port are the paths that higher education institutions in Hainan Province

need to insist on and precisely match in the process of its development. They are not only the levels of demand that higher education institutions in Hainan Province should pay attention to in the long run, but also the areas that can show the most important value of higher education in the process of the development of the Hainan Free Trade Port. All kinds of higher education institutions in Hainan Province should realize effectively meeting the various needs at different levels, in the construction of the Hainan Free Trade Port, such as the specification of talent training, the establishment of scientific research problems and the main direction of direct social services. Therefore, it is necessary to accelerate the optimization of the layout structure of disciplines and majors. According to the Guiding Opinions of the CPC Central Committee and the State Council on Supporting Hainan in Comprehensively Deepening Reform and Opening Up and the key industries developed in Hainan, we should combine the discipline base and characteristics of Hainan's higher education, focusing on increasing the disciplines in the fields of marine, tropical agriculture (seed industry), aerospace, health, information technology, etc., expanding the proportion of students enrolled in disciplines such as normal education, law, tropical medicine, etc. In addition, disciplines such as modern logistics (shipping), law, foreign languages, ecology and environmental protection should be added properly so as to better contribute to the construction of Hainan's Free Trade Port.

Path II: It is the path chosen mainly in the process of the construction of the Free Trade Port in Hainan where the actual demand is the conventional demand and the potential demand is the unpredictable demand. The unpredictability of potential demand further increases the difficulty of higher education in Hainan Province to effectively meet the specific demands in the process of the construction of the Hainan Free Trade Port. The prediction of potential demand in the process of Free Trade Port construction can provide specific forward-looking and leading solutions to many problems, which can more effectively avoid possible problems in the construction process, and which is the demand type that Hainan higher education should focus on. When the higher education serves the stable conventional demand and unpredictable potential demand in the process of construction of the Hainan Free Trade Port, it should satisfy the more stable conventional demand as comprehensively as possible. Based on meeting the conventional demand, we should make as many plans and responses to the potential demand in the process of construction of Free Trade Port according to data analysis and extensive research. For example, higher education institutions can establish international economics and trade majors according to the stable conventional demand for international trade talents in the process of construction of the Hainan Free Trade Port, and constantly improve the professionalism and effectiveness of its personnel training. At the same time, in order to cope with the unpredictable potential demand during the construction of the Free Trade Port as much as possible, forward-looking courses and training directions can be added to the process of developing the training program for students of international economics and trade, so as to better adapt to the unpredictable potential demand during the construction in the future.

Path III: It is the path chosen mainly in the process of the construction of the Free Trade Port in Hainan where the actual demand is the unconventional demand and the potential demand is the unpredictable demand. The double obstacles of unconventional and unstable actual demand and unpredictable potential demand greatly increase the difficulty of Hainan's

higher education to promote the construction of the Hainan Free Trade Port, making Path III the most difficult path among all the promotion paths. The law of external relations of higher education determines that the education system must be fully adapted to the development of political, economic, cultural [Maoyuan Pan, Weilian Wang, Higher Education, Fuzhou: Fujian Education Press 2013, p. 31.] and other social subsystems, and deal with the relationship between productivity and the level of scientific and technological development, cultural traditions, social systems, as well as population, resources, ecological environment, geography, ethnicity and other factors. The education system and the above subsystems and elements are closely related and influence each other. When the needs of the external subsystems and the external environment of the education system change, if the education system does not adapt well to the changes in the external needs and environment, it will make it difficult for the education system to coexist with other subsystems, resulting in many discordant and even conflicting phenomena. In the face of the changing conventional needs and unpredictable potential needs during the construction of the Hainan Free Trade Port, such conflicts will be further increased. In order to make Hainan's higher education play a better role in the process of constructing the Hainan Free Trade Port, we must choose reliable grips in concrete practice and make forward-looking responses to the changing needs. For example, a professional think tank for the construction of the Hainan Free Trade Port can be set up to find the best path by studying and learning from the successful experiences of developed countries such as Singapore and the Netherlands in the port business and combining them with our specific national conditions, and to make adequate higher education responses.

Pathway IV: It is the path chosen mainly in the process of the construction of the Free Trade Port in Hainan where the actual demand is the unconventional demand and the potential demand is the predictable demand. Compared with the instability of actual demand and unpredictability of potential demand in path III, the potential demand in path IV becomes predictable potential demand, and the predictability of potential demand further reduces the difficulty of higher education to serve the construction of the Free Trade Port. Education has a pioneering, fundamental and overall strategic position in economic and social development [Xibin Jin, Economics of Education, Beijing: People's Education Press, 2009 edition, p. 107.]. Higher education institutions are specialized institutions for human capital accumulation and reserve, playing a very important role in the historical process of scientific and cultural knowledge dissemination, playing an important function of spreading scientific and cultural knowledge created by human beings, popularizing scientific knowledge and expanding the effectiveness of science and technology and production. The dissemination of scientific and cultural knowledge is to better cultivate the professionals needed by society. In the process of construction of the Hainan Free Trade Port, there is a huge talent gap for various types of specialized talents at all levels, and higher education in Hainan Province will assume an indispensable historical responsibility in the cultivation of various talents. In the face of the predictable potential demand and the changing actual demand, the higher education institutions in Hainan Province can realize the effective promotion through the following ways: Firstly, the universities in Hainan Province should provide the construction of the Hainan Free Trade Port with talents equivalent to its demand according to the predictable potential demand. For example, after the closure customs

operation in the Hainan Free Trade Port, the number of international schools in Hainan will be increased to meet the need of enrolling the children of a large number of international talents, and the demand for high-level faculty will be increasing. Therefore, normal education schools in Hainan Province should speed up the pace of internationalization, take advantage of the policy dividend of Hainan Sino-foreign cooperatively-run school (project) jointly approved by the Ministry of education and the provincial educational department, cooperate with foreign high-level universities to build early education, preschool education and primary education majors, cultivating many teacher teams with patriotism, international vision and professional skills to meet the development needs of the Hainan Free Trade Port. Secondly, higher education institutions in Hainan Province should cultivate all kinds of professional talents at different levels such as junior college students, undergraduate and postgraduate. Finally, higher education institutions should constantly improve the pertinence of their major settings and the effectiveness of talent training, provide various opportunities for students to practice in the Free Trade Port according to the predictable potential demand, and constantly improve the training quality of various talents, to better promote the construction of the Free Trade Port.

5. ACKNOWLEDGEMENT

The authors would like to thank the Social Science Foundation of Hainan Province (CN) (Grant No. Hnsz2021-11) and Research Project of the Education Department of Hainan Province (CN) (Grant No. Hnjg2021-10).

6. REFERENCES

- [1] Central People's Government of the People's Republic of China. Guiding Opinions of the CPC Central Committee and the State Council on Supporting Hainan in Comprehensively Deepening Reform and Opening Up. [EB/OL]. [2018-4-14]. http://www.gov.cn/zhengce/2018-04/14/content_5282456.html.
- [2] Meng Li, Management Innovation in Free Trade Zones: Lessons from Overseas Experience, Open Guide, No. 1, 2017, p. 75.
- [3] Yiwen Ling, Bottlenecks Facing the Construction of Free Trade Zone and the Way Forward, Journal of Xinjiang Normal University (Philosophy and Social Science Edition), No. 6, 2018, p. 146.
- [4] Xiaolu Cao and Chongmin Wang, Research on the innovation of temporary arbitration mechanism for the construction of free trade port in Hainan, Journal of Hainan University (Humanities and Social Sciences Edition), Vol. 3, 2018, p. 2.
- [5] Guoqiang Ma, Xiaotong Zhao, Analysis of the Financial Environment for Building a Free Trade Port in Hainan with Chinese Characteristics, Journal of Hainan University (Humanities and Social Sciences Edition), Vol. 6, No. 6, 2018, p. 27.
- [6] Peng Sun, Wenli He, Shijie Li, Measurement of Hainan's external openness since the establishment of the province and comparison with other special economic zones - and policy recommendations for building a free trade port with Chinese characteristics in Hainan, Journal of Hainan University (Humanities and Social Sciences Edition), Vol. 6, No. 6, 2018, p. 8.
- [7] Tianbao Qin, Environmental Regulation in the Construction and Development of Free Trade Port, Journal of Hainan University (Humanities and Social Sciences Edition), Vol. 3, No. 3, 2018, p. 13.
- [8] Jun Li, Yafeng Song, A Re-examination of the Purpose of Social and Personal Ontology Education, Educational Theory and Practice, No. 10, 2017, p. 3.
- [9] John S. Brubaker, On the Philosophy of Higher Education, Hangzhou: Zhejiang Education Press 1987, p. 15.
- [10] Maoyuan Pan, Weilian Wang, Higher Education, Fuzhou: Fujian Education Press 2013, p. 31.
- [11] Xibin Jin, Economics of Education, Beijing: People's Education Press, 2009 edition, p. 107.