Available online www.jocpr.com

Journal of Chemical and Pharmaceutical Research, 2014, 6(4):322-327

Research Article

ISSN : 0975-7384
CODEN(USA) : JCPRC5

Research on the creative people development of Fujian-Taiwan based on the ecological management theory

Zhang Xiang-Qian* Yin Li-Ping and Liu Xuan

Business Administration College, Hua Qiao University, Chenghua North Road, Quanzhou, P. R. China

---

ABSTRACT

The creative people is the core resources to promote economic development, this paper through analysis the ecological factor impacting creative people development in Fujian-Taiwan, Constructed the creative people development system, that based on the creative people`s strategic cooperation between Fujian and Taiwan, effect by inside and outside eco-environment. this paper through learn the kernel of ecological management theory, such as holistic view, cooperation view and sustainable view, proposed intensify talent introduction, give education the full play the role of talent training, improve guarantee mechanism about talent development and other measures.

Key words: Ecological management theory; Cooperation between Fujian and Taiwan; Creative people; development

---

INTRODUCTION

Numerous theories and practices prove that innovative talent is the core resource of driving economic development. In order to effectively develop innovative talent, Fujian has issued several policy documents, covering various aspects of talent introduction, cultivation, application and stimulation. Meanwhile, 7 special regulations involved with Taiwan are formulated successively and over 60 local laws and regulations involved with Taiwan are issued. Thereby, it has become the earliest province of issuing the most laws throughout the country. At present, now comprehensive strength of Taiwan is in the last position among Four Little Dragons. In order to boost the economy, Taiwan has proposed mid-and-long term economic development concept (golden decade) and vigorously developed 6 emerging industries. However, innovative talent resources are severely insufficient in terms of economic development. Fujian and Taiwan are similar in regional natural background and historic culture, and they have temporal recursive difference in economic development. Therefore, a congenital advantage has been provided for development of innovative talents in Fujian and Taiwan. Under the background where economic globalization and regional economic integration are enhanced, integration of innovative talents in Fujian and Taiwan has become a new tendency.

2. Overview about relevant studies

Ecology has stepped over the chasm between natural science and social science after development for over 100 years since 1869 when the German biologist, E. Haeckel proposed the concept of ecology, thus ecological management science appeared. The subject premise is established on the basis of “ecological man” hypothesis. In another word, it considers that human being also has ecological attributes and is restricted by natural law. Thus human has to realize harmonious development with nature. Goodwill standard of human behavior is whether he is beneficial to integrity, harmony and stability of nature. Ultimate goal of human activities is to construct and regulate the ideal order between man and nature as well as man and man[1]. Talent ecology is formed by applying ecological management theory and method to modern talent management, and it mainly studies the relation between talent development & employment and environment. Talent ecology abstracts talents and environment where they live into a model ecosystem. By applying and referring to knowledge and perspectives of natural ecology, it studies growing

of talents, thus the talents will gain sustainable development. ZHANG Yifang[2] proposed three basic principles of talent ecology: environment control principle, interrelation & integrality principle, and principle of quantity deciding quality. PENG Jianfeng[3] pointed out that competition of talent attractiveness was essentially the competition of talent ecological environment. SHEN Bangyi[4], ZHU Daming[5], MA Weiguang[6], WU Jiangxing[7], HUANG Mei and WU Guowei[8] etc., who also carried out related research.

3. Current situations of innovative talent development

Table 1 General situation about innovative talent development of Fujian and Taiwan in 2012

Key index	Fujian	Taiwan
Labor force population (10 thousand people)	2568	1134
Tertiary industry personnel and constituent ratio	25.0:38.8:36.2	5.0:36.2:58.8
Scientific and technical personnel	239938	287565 (2011)
Population of researchers every 10 thousand people	64.0	238 (2011)
R&D expenditure	2709891 (10 thousand Yuan)	4132.90 (New Taiwan Currency; 100 million Yuan) (2011)
Proportion of R&D expenditure in GDP (%)	1.38	3.02 (2011)
Population of higher education students every 10 thousand people	230	582

Data source: *China Statistical Yearbook* and *Fujian Statistical Yearbook* of 2012

The innovative talent resources of Fujian are behind Taiwan, as shown in Table 1, the specific reflection includes: total talents are insufficient; population of higher education students every 10 thousand people is less than 40% of that in Taiwan; population of professional and technical personnel talents every 10 thousand people is lower than the national average. Talent quality does not meet the development requirements. According to *Guidance Directory of Importing Urgent Talents to Fujian in 2013*, Fujian especially lacks top talents in 25 key industries including electronic information, equipment manufacturing, petrochemical industry, automobile industry, and shipping industry. The imbalance between industry structure and employment agency is quite severe. Besides, investment in innovation funds is low and innovation ability is insufficient. Input intensity of R&D expenditure in Fujian was 1.38% in 2012, less than half of Taiwan. In terms of patent application and authorization, the whole province applied for 42773 patents and involved 30461 authorizations in 2012, only occupying 8.7% and 11% of the national total. There are 85 higher education institutions in the province, in which there are only 4 "211" higher education institutions. Most universities are newly built. Many higher vocational education schools are upgraded from technical secondary schools. As a result, the innovative talent training mode is imperfect for the major is single.

Taiwan also exist severe problems. Taiwan lacks independent innovation ability and is short of innovative talents of emerging industries. The fundamental research of Taiwan is not solid enough and key technology of high-tech industry is controlled by advanced countries. There is a severe imbalance between human capital structure and industry structure, and talent shortage in high-tech industry co-exists with unemployment in traditional industries. Taiwan has ignored development of other high-tech industries except information hardware industry, such as software industry, biotechnology and environmental protection industry for a long time, so its innovative talent cultivation has been simplified. Talent outflow is quite severe in Taiwan, about 20 to 30 thousand people move out from Taiwan every year, in which white-collar workers are in the majority. The quantity of higher education institutions is increasing rapidly, thus supply seriously exceeds demand. Many schools are faced with insufficient enrollment. Meanwhile, quality of talent cultivation decreases. Unemployed people of college degree or above occupied 41.11% of the total unemployed population in 2010. The average unemployment weeks also extended to 30.72 weeks.

4. Innovative talent development system of Fujian and Taiwan based on ecological management theory

4.1 Analyses on influence factors of innovative talent development in Fujian and Taiwan based on ecological management theory

4.1.1 Analysis on external ecological environment

External ecological environment of innovative talent development covers politics, economy, technology, education and culture. Political factor refers to policies and regulations issued by the state and government as well as the implemented talent system, is the foundation of innovative talent development. Economy factor includes social and economic conditions as well as the operation conditions, development tendency, industry structure, transportation and resources. It influences distribution, structure and category of innovative talents. Technology factor covers technology level, technology force, technology system, technology policy, and technology legislation. It is the huge force of driving innovative talents to be occupied in innovation activities. Education factor plays a direct role in innovative talent development; the primary function of education is to promote personal development and cultivate personalized talents. A good humanistic environment factor includes living environment, work environment, cultural

environment and public opinion environment. As the social foundation of constructing innovative talent growth and development, it is full of influence in the aspect of ideology.

4.1.2 Analysis on internal ecological environment

Internal ecological environment of innovative talent development refers to the set of microenvironment factors that play an important role in innovative talent development, covering enterprises, government, scientific research institutions, higher education institutions, and talent service agencies. Innovative talent development depends on the guarantee of good policy and system. As both the gathering place of numerous high-level innovative talents and an important site of cultivating innovative talents, higher education institutions and scientific research institutions are of vital importance. Enterprise is the subject of independent innovation. In Western developed countries, over 80% of innovative products come from enterprises. As a service organization of talent allocation and flow, talent service agencies have built a communication bridge between employers and innovative talents. Its functions in regional talent development are reflected in improvement for efficiency and benefit of regional talent cooperation and guidance for gathering of talents in key industries and competitive industries through market operation mode.

4.1.3 Strategic cooperation of innovative talent development in Fujian and Taiwan

Fujian and Taiwan have many common and complementary parts in terms of innovative talent development. (1) Complementary talent resource base. Fujian possesses some advantages in fundamental researches, while Taiwan is slightly better than Fujian in application technology talents as well as financial, trade and enterprise operation and management talents. (2) Stable political base. Due to reform and opening policies in mainland, there is some positive preferential policies toward Taiwan and policy support of Fujian toward Taiwan. (3) Good economic base. In 2008 when global financial crisis broke out, Taiwan effectively weakened the impact of financial crisis via its extensive economic and trade cooperation with mainland. As for Fujian, economic, trade and cultural exchanges and cooperation is comprehensively strengthened and deepened via the important platform of prior trial. (4) Solid culture base. "Five-edge" advantage is the culture base for Fujian and Taiwan to produce and establish strategic cooperation of innovative talent development. With realization of "three exchanges" and signing of "ECFA" between Taiwan and mainland has provided an important opportunity.

4.2 Innovative talent development system of Fujian and Taiwan based on ecological management theory

From the research perspective of ecological management theory, innovative talents and the social environment have formed an ecological system of innovative talent similar to natural ecosystem. Mutual effect and mutual influence exist among the innovative talent individual, population and external environment inside the system. Similar to natural ecosystem, innovative talent development system can be established in Fujian and Taiwan. As shown in Fig. 1, innovative talent development system of Fujian and Taiwan is based on strategic cooperation between Fujian and Taiwan. The united training mode of "government – enterprise – school – research institution – talent service agency" is formed, and efficient development of innovative talents is realized under the effects of external environment including politics, economy, technology, education and humanity.

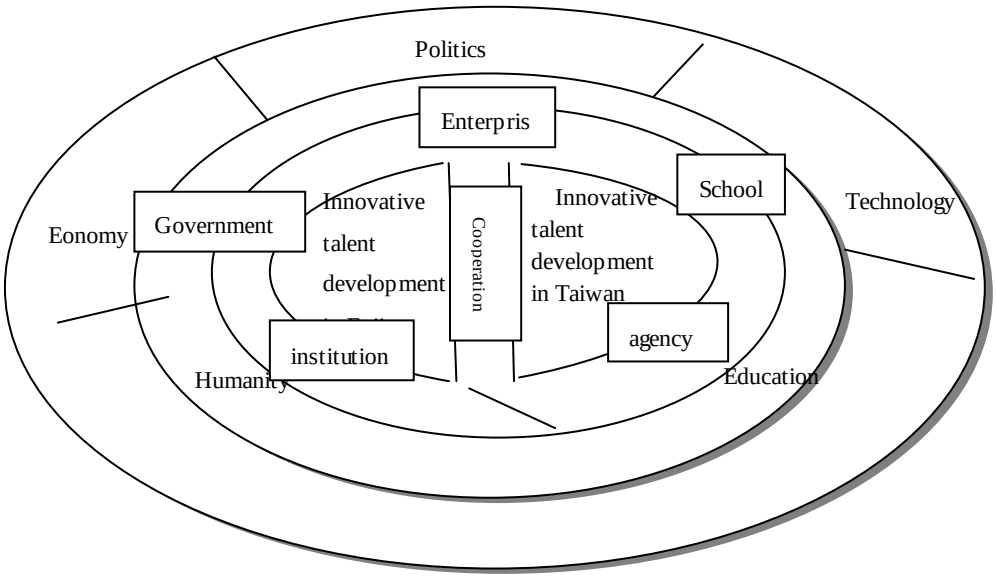

Figure 1. Innovative talent development system of Fujian and Taiwan

5. Innovative talent development principle of Fujian and Taiwan based on ecological management theory

5.1 Principles of sustainability

Ecological management theory treats long-term sustainability as the basic value. It tries to solve sustainability problems among generations rather than focus on handling the current problems[10]. Innovative talent development system is an organic system as well as a system of sustainable development. From the growing law and knowledge structure of innovative talents, innovative talents need a process of continuous accumulation and enhancement. Therefore, in terms of innovative talent development, talents should be endowed with the internal condition of sustainable development under combined action of government, enterprises, higher education institutions, scientific research institutions, and talent service agencies. From the aspect of external support system for innovative talents, innovative talents together with the economic, technological, educational and cultural environments where they grow have formed an ecological system of interaction, interdependence and mutualism. Moreover, transmission and exchange of substance, energy and information are conducted continuously.

5.2 Principle of integrity

According to the thought of ecological management theory, principle of integrity aims at scientific management for the overall structure composed of factors. It tries to realize the optimum management effect through combined action of various factors in the integrity. Therefore, various factors of affecting innovative talent development should be associated, so as to form a value chain of innovative talent development. The value chain will closely connect stakeholders of the overall innovative talent development, and innovative talent development is a factor in value net. The subject of innovative talent development has to coordinate relation of other factors in various aspects, optimize living environment of talents, and meanwhile integrate external resources. In addition, according to principle of integrity, ecological management effect of regional combination will be far better than ecological management effect of a single aspect.

5.3 Principle of cooperative symbiosis

In a complete ecological system, a system formed in competition, neutral, cooperation and symbiosis among different species through long-term interaction and natural selection is a highly optimized organization system. No wasting of resources exists in the system; it can maintain dynamic ecological balance by itself and realize harmonious coexistence with the external environment. Development of innovative talents in Fujian and Taiwan can fully refer to the principle of ecological system optimization for design and optimization. The two places also have differences and complementary space in technology, economy and education, and comparative economic interest is contained. Through cooperative development of innovative talents, the two places can realize optimal configuration and efficient integration of various factors in the system, and meanwhile improve competitiveness of innovative talents together.

6. Supporting management measures of innovative talent development in Fujian and Taiwan

6.1 Strengthening strategic cooperation between the two places in innovative talent development

Firstly, cooperation development departments of innovative talents in Fujian and Taiwan needs to be promoted, and official guiding institutions and contact coordination mechanism should be established. They must discuss important issues before them, like law and policy, resource allocation, scientific research and educational training. Secondly, the force of educational cooperation between Fujian and Taiwan can be increased. The gate of mutual academic recognition on both sides of the Taiwan Straits should be reopened, so as to promote joint admissions, student exchange and mutual recognition of credit between the two places. Academic exchange must be by way of teacher exchange and mutual establishment of bases. Thirdly, technological exchanges and cooperation between Fujian and Taiwan should be expanded. The two places can set up Fujian and Taiwan Science Park according to the development requirements of high-tech industry, so as to attract and gather talents, form joint research, and share the research achievements. Fourthly, cooperation among talent service agencies of Fujian and Taiwan must be accelerated. Talent service agencies of Fujian and Taiwan should be encouraged to establish branches in the other side and intensify talent resource market cooperation and information resource sharing between the two places.

6.2 Gathering talents via transformation, upgrading and in-depth but joint of industries

On the one hand, Fujian and Taiwan should strengthen upgrading of industry structure and extend to the top end of "smiling curve". Producer services including research and development, design, brand cultivation and supply chain management need to be intensified, and distinct "technology intensive" modern industrial system must be established. Innovative talents can be gathered by setting up innovation transformation service platforms such as national key laboratory, engineering and technological research center. On the other hand, Fujian and Taiwan can depend on the science park and focus on advanced manufacturing industry, strategic emerging industry and producer services. They can put forth effort to carry forward connection of three leading industries which are electronic information, equipment manufacturing and petrochemical engineering, deepen the joint of producer services including industrial design, modern logistics, and e-commerce, and meanwhile intensify cooperation in high-end

manufacturing industry and modern service industry. At the same time, united talent development center can be established to give play to advantages of different fields. In this way, training can be organized for professional and management talents in the two places, so as to promote their professional skill and management skill.

6.3 Increasing the force of introducing high-level innovative talents

Firstly, Fujian and Taiwan should form a combined force to introduce talents. By fully utilizing the innovation advantage of Taiwan and the development opportunity of west coast of Taiwan Strait and taking advantage of its role as home town of overseas Chinese. Furthermore, cooperative development of human resources among mainland, Taiwan and Hong Kong has to be carried out positively; talent exchange and training interactive mechanism needs to be formed. Secondly, talent introduction platform should be set up. We should stick to introducing talents via project, task and industry. Butt joint between talents and projects needs to be promoted, and interaction with industry has to be enhanced. Construction for scientific research institutions, technological innovation center and high-tech enterprise incubation base should be reinforced in Fujian and Taiwan. Attraction for high-level talents needs to be enhanced in Fujian and Taiwan. Thirdly, Fujian and Taiwan should establish "flexible" mechanism of introducing talents, to simplify talent introduction procedures and open the fast lane for talent introduction. By combining "ownership" with "application", talents can be introduced by adopting various methods such as project cooperation, short-term part-time job, investigation and giving lectures, technology investment, and cooperative management.

6.4 Fully utilizing education to cultivate innovative talents

In terms of vocational education, the mature vocational education system of Taiwan can be utilized to recruit students of Fujian. Secondary vocational education can be developed by focusing on industrial cluster in Fujian and Taiwan; vocational education for undergraduates and maters needs to be intensified, and it can be intersected with regular higher education at undergraduate level. In another word, junior college of vocational education can be promoted to regular higher education institutions. At the stage of undergraduate education, curriculum system structure of science and engineering major should be adjusted by combining liberal education with professional education. Meanwhile, direction of subject and major can be set according to the talent demand of economic development. The training objective is intermediate technological, academic and professional talents. At the stage of postgraduate education, elite education must be implemented; top talent cultivation model under the background of mass higher education should be positively explored. The training objective of knowledge transfer needs to be transformed into knowledge innovation as soon as possible[9]. In terms of further education, Fujian and Taiwan should focus on organizing various high-end trainings and further education at postgraduate level. Postgraduate education of professional degree needs to be developed vigorously; cultivation for talents of interdiscipline, boundary science and emerging discipline has to be valued.

6.5 Establishing "government – enterprise – school – research institution – talent service agency" joint development system of innovative talents.

The specific modes is a technology innovation alliance guided and supported by the government, and meanwhile it is formed via the abundant capital and strong industrialization ability of enterprises by combining with the scientific and technological bases of the region and scientific research institutions or universities. It will share the research achievements according to the agreement. A high-tech park can be built. By depending on scientific research institutions of Fujian and Taiwan as well as technological and intellectual support from higher education institutions, an area can be marked out in a certain place of Fujian Province to gather a large batch of high-tech enterprises in Fujian and Taiwan, and the government should provide preferential policies and a good soft and hardware environment. Innovative talent cultivation base should be set up in Fujian and Taiwan. The cultivation base can be based on the strength of higher education institutions and scientific research institution, and oriented by talent demand of new high-tech enterprises in Fujian and Taiwan. It is driven by training institutions and talent market together, and the training mode of "talents + project" is implemented. Cooperation between school and enterprise can be strengthened. By relying on higher education institutions, talents can be cultivated through cooperation among schools, cooperation between school and enterprise, cooperation among school etc. [10].

6.6 Optimizing guarantee mechanism of innovative talent development

(1) Perfect public service system of talent development in Fujian and Taiwan. (2) Strengthen public service platform construction. Information platform, employment service platform of college graduates, talent training & education platform, and project talent exchange platform of Fujian and Taiwan must be created vigorously. Regional talent resource sharing and talent resource service connection should be realized. (3) Increase allocation force of talent resource market, and perfect talent market system. (4) Establish talent information network system. Construction of talent information network platform should be accelerated in Fujian and Taiwan, to realize networking and connection of talent market within the region. Moreover, cooperative relationship must be built with overseas recruitment agencies, to establish talent information network system of communicating with the world. (5) Construct guarantee mechanism of talent flow in Fujian and Taiwan. Policies about transit, inhabitation, employment,

entrepreneurship, participation in social management should be perfected during the process of talent flow. The legal environment should be optimized; especially the protection degree for intellectual property needs to be increased.

CONCLUSION

At present, innovative talents have already become core resources of economic and social development. It is the only road of determining the victory of Fujian and Taiwan under the era of knowledge-driven economy to construct a favorable environment beneficial to production and growth of innovative talents. We believe that based on strategic cooperation between Fujian and Taiwan in innovative talents, innovative talent and politics, economy, technology, culture and education can promote each other and develop together. The government, higher education institutions, scientific research institutions, enterprises and talent service agencies must make concerted effort and cooperate with each other to drive development of innovative talents. In this way, the purpose of increasing talent quantity, enhancing talent quality, improving talent structure, and optimizing talent environment will be realized. Finally, economy of Fujian and Taiwan will take off.

Acknowledgments
This paper is one of The research program for Fujian China characteristic socialism theory system (2013A003), China Humanities and Social Science Fund which addressed by Zhang Xiangqian(11BJY003) and Huaqiao University's Academic Project Supported by the Fundamental Research Funds for the Central Universities which addressed by Zhang Xiangqian (12SKGC-QT02), Express thanks to the Fund support and all the participators.

REFERENCES

[1]Wei Guangxing. On three orientations of the integration between management and ecology. Science and Technology Management Research. 2005, (5): 119-122.
[2]Zhang Yifang. Talent Ecology and Possible Ways for China to Win Nobel Prize. Science of Science and Management of S. & T. 2001,(7): 59-61.
[3]Lu Jiping. Ten Standards of Benign Talent Ecological Environment – Visiting Professor PENG Jianfeng of Renmin University of China. Beijing Talent Market Daily. 2003-11-26.
[4] Shen Bangyi. On Several Basic Concepts of Talent Ecology. Talent Development. 2003, (12): 22-23.
[5]Zhu Daming. Talent Ecological Environment Construction Strategy. China STAFF Journal. 2004, (6): 57-59.
[6]Ma Weiguang. Ecology Rule and Talent Ecosphere .Human Resources. 2004, (Z1): 32-33.
[7]Wu Jiangxing. Perfecting Entrepreneurial Ecological Chain and Cultivating Innovative Skilled Sci-tech Workers.Science Advice (Decision Management). 2007, (3): 26-27.
[8]Huang Mei, WU Guowei. Research on the Ways of Innovation Talents Development Based on Ecological Methodology [J]. Science & Technology Progress and Policy. 2008 (12): 222-226.
[9]Yu Guirui. A conceptual framework and the ecological basis for ecosystem management .Chinese Journal of Applied Ecology. 2001, (5): 787-794.
[10]Wu Shengxiong. The Construction of the Economic Zone on the West Coast of the Straits and Talent-Training in Fujian Higher Institutions. Journal of Fujian Education Institute. 2011,(2):29-31.