

## **Research Trend of Discipline Transformation in Local Colleges Under the Background of “Made in China 2025”**

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**Abstract:** *The new round of global competition triggered by the third industrial revolution and the publishing of “Made in China 2025 ” provide an opportunity for the transformation of discipline construction in local colleges, which should be seized by academic circles and discipline builders. In order to improve servicing quality of discipline construction and fully reflect its’ value, academic circles and discipline builders should innovate research methods, construct theoretical system and measures to promote the integration of discipline and local industry with the mission of serving the national and local industrial structure in adjustment and upgrading, based on scientific and technological output, guided by transformation and development of colleges, focusing on the achievements transformation, innovative and applied talent training and social services.*

**Keywords:** “Made in China 2025 ”; discipline construction; transformation for colleges

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### **I. Background of “Made in China 2025” and Transformation for Colleges**

#### **1.1 Advocation in The Third Industrial Revolution and Coping Strategies of Major Industrial Countries**

In 2011, An American futurist, Jeremy Rifkin put forward a subversive view of the industrial revolution symbol in his book “The Third Industrial Revolution”. He believes that it is new energy that promote human civilization in a more complicated development direction rather than technical progress. The combination of new communication technologies and new energy systems indicate that an era of economic transformation is coming. In the 19th century, the combination of steam engine and printing technology gave birth to the first industrial revolution. In the 20th century, the combination of fuel internal combustion engine and telecommunications technology triggered the second industrial revolution. Nowadays, the combination of Internet information technology and renewable energy has ushered in the dawn of the third industrial revolution.[1]

Rifkin’s “The Third Industrial Revolution” triggered a deep reflection in global scholars. In 2012, “Economist” published a series of articles based on the theme of the third industrial revolution, which held that the third industrial revolution is the “digital revolution” and the use of digital manufacturing, new energy and new materials would change manufacturing and the way of people’s living.[2] Chris Andrew, an American scholar, pointed out that the digital manufacturing industry such as new materials and 3D printing technology are symbols of the third industrial revolution, [3] McKinsey Research Institute and Schonberg regarded “Big Data” as the symbol of new industrial revolution. They believed that “the era of big data has influenced every aspect of the world, from business technology to medical, government, education, economy, humanities and other areas of society.” [4]

Amid the surging new wave of industrial revolution, major industrial countries have put forward strategies to achieve re-industrialization. Since 2009, the British government has announced the “Low Carbon Transformation Plan of the United Kingdom” and Japan has proposed the “Low Carbon Social Action Plan”. The United Kingdom and France introduced the “Digital Country” strategy. The United States launched the “National Strategic Plan for Advanced Manufacturing”, and in 2013, Germany began to actively implement the national strategy known as the Industry 4.0 project.

In this background, the State Council of China officially announced “The Plan of Made in China 2025” in May 2015, proposing to use three decades to implement a three-step strategy, achieve four major transformation in the top ten high-tech fields, and enter the ranks of the world's manufacturing powers in 2035.

#### **1.2 “Made in China 2025” and Transformation for Colleges**

In February 2014, the State Council regarded the development of modern vocational education as the key point for the college reform, especially the “transformation of ordinary undergraduate colleges to the technology-based colleges” . The introduction of the “Made in China 2025” has pointed out the direction for colleges to further clarify their own values, serve the economy and culture construction, and achieve

transformation. Under this background, it has become an urgent issue for local colleges that how to adapt to the national development strategy and regional industrial transformation development, which should be seriously consider by discipline builder and academic circle.

## **II. Status and Shortcomings of the Research on the Disciplines Transformation in local Colleges**

### **2.1 The Status of the Research in local Colleges**

#### **2.1.1 Problems of Discipline Construction in Local Colleges**

Most discipline construction work in local colleges started less than 20 years. From the perspective of foundation and ideas of discipline construction, there are some difficulties such as weak foundation, shortage of talents, severe shortage of construction funds, weak subject consciousness, and obvious shortcomings in innovation ability.<sup>[5]</sup> And there are conceptual problems such as blindly seeking for the integrity, eager for quick success and instant benefits, put more emphasis on scientific research rather than education, academic rather than service, talents introduction rather than team training;<sup>[6]</sup> From the perspective of discipline construction and regional demand, there is conflict between resource supply and regional economy demand.<sup>[7]</sup> Ni Xiaomin, Ren Baiqiang, Yan Xiaoyi made surveys of key industries and related enterprises in Wenzhou in Zhejiang province and they found that superior disciplines in Wenzhou local colleges are difficult to meet the demand of enterprises for professional talents. Enterprises believed that most majors of local colleges in Wenzhou do not keep up with the development level of the industry;<sup>[8]</sup> From the perspective of the effectiveness of discipline construction, there are also some problems, such as the lack of horizontal comparative advantages, the non-linear characteristics of academic achievements and disciplines, and the unbalanced development between achievement transformation and disciplinary innovation.<sup>[9]</sup>

#### **2.1.2 Discipline Construction Approach in Local Colleges**

Discipline construction approach is an important issue that is focused by local colleges and academic circle. Scholars have proposed some suggestions such as upgrading the core competitiveness of local colleges with characteristic disciplines,<sup>[10]</sup> implementing unbalanced development strategies, adjusting and optimizing the discipline structure,<sup>[5]</sup> building discipline system with distinctive features, creating high-level discipline teams, and put great effort on the postgraduate education<sup>[11]</sup>. They advocated that discipline construction should adapt to the development of local economy, culture and education, promote the discipline construction of local colleges with key disciplines and postgraduate education to actively create ideas of disciplines culture,<sup>[12]</sup> clarify the orientation of disciplines and value trends, promote innovative cooperation in industry-academy-research, focus on solving the shortcomings of innovation and low-level cycles, and actively strive for development strategies supported by policies and external environment.<sup>[13]</sup> They put forward that some institutional measures should be improved, such as cooperation of working mechanism in Policy-Industry-Academy-Research, institutional innovation, project management, classification evaluation of scientific research and incentive policy system.<sup>[14]</sup> The internal fitness, external adaptability and discipline ecology should be integrated into discipline construction to enable disciplines construction to reflect the value of academy, society and ecological development demands.<sup>[15]</sup> They also advocated that discipline construction should be devoted in discipline system that is suitable for development features in colleges, talent training quality, social service ability, the comprehensive assessment mechanism of disciplines, the convergence of academic achievements and disciplines direction to form discipline advantages, strengthen collaborative innovation and enhance the ability of discipline construction in local colleges<sup>[9]</sup>

#### **2.1.3 Social Service Function and Implementation Mode of Discipline Construction in Local Colleges**

In recent years, the social service function of discipline construction has become the focus of academic circle. Scholars have carried out researches on the construction of regional economic services, talent training and its realization mode. Relevant results show that the construction of disciplines in local colleges should be oriented to meet the needs of regional economic development and regard the training of technical workers, specialized talents, and high-end talents as their central tasks to establish a mechanism of interdisciplinary construction and regional economic interaction, cultivate specialty structure and talent training system that cope with development of regional economy, society and technology,<sup>[16]</sup> adhere to the discipline construction of local colleges with service and interaction to promote development.<sup>[17]</sup> The mode of cooperation between local colleges and local governments and enterprises is collaborative research that designed by Industry-Academy-Research to joint effort of bases establishment and project traction. The government, colleges and enterprises should find common interests to focus on joint work mechanism, institutional innovation, project management, classification evaluation of scientific research and incentive policy system.<sup>[14]</sup> Yan Guangfen pointed out that regional development needs are the driving force for the establishment of key disciplines while the key disciplines are the intellectual pools of regional development.<sup>[16]</sup> The key to the adaptability of discipline construction are its “fitness” and “effectiveness” for regional economic transformation. The efforts of local

colleges in adjustment of subject structure, optimization of subject organization, innovation of discipline management are embody of its' integration in the process of regional economic transformation and development.<sup>[18]</sup>

#### **2.1.4 New Economic Forms and Transformation for Colleges**

Western scholars' researches on the third industrial revolution have aroused the resonance of domestic scholars. Drawing on the education strategy of developed countries to cope with the third industrial revolution, some scholars have carried out theoretical analysis on the relationship between education and economic transformation in the process of industrial revolution. Based on the internal role and the spillover effect of education, they put forward the policy recommendations for education to promote China's economic transformation.<sup>[19]</sup> The severe talents and innovative talents required by the third industrial revolution have brought challenges to the global talent training model. China's education reform should start from changing ideas and pay attention to the upgrading education information into national strategy, improvement of the lifelong education system, reinforce of the construction of teaching staff, promotion of the reform of education system, system innovation, and the related education legislation.<sup>[20]</sup> In the field of higher engineering education, it is necessary to strengthen the integration of knowledge structure represented by the intersection of new energy, internet and manufacturing, deepen the distribution of cooperative talents and promote the innovative entrepreneurship education of engineering talents.<sup>[21]</sup>

### **2.2 Shortcomings of related Researches**

#### **2.2.1 Fragmentation and Insufficient System Theory Construction and Innovation in the Existing Researches**

Discipline construction in local colleges is a systematic project involving the reform of higher education system and mechanism, the construction of discipline management and culture atmosphere, the transformation of academic innovation and achievements, talents training and social services. The existing researches include the main content of discipline construction in local colleges, but they are lack of innovation and systematic research results with obvious fragmentation characteristics, insufficient macro-theoretical construction. And the main results are mainly showed on research papers but little on monograph.

#### **2.2.2 Lack of Applied Researches and Inadequate Adaptation Studies in Line with Regional Development and Industrial Restructuring**

Most of the existing researches are theoretical discussions. They are lack of systematic investigation and applied researches on regional economic culture and social development of discipline construction services in local colleges. The research depth and the availability of research results are insufficient. The theoretical construction and application have not been received enough attention in transformation of discipline construction. According to the adjustment of the new planning service industry structure and the cultivation of applicable innovative talents, the introduction of the "Made in China 2025" put forward new requirements for the research on the transformation of the discipline construction in local colleges.

#### **2.2.3 Relatively Narrow Respective and Single Research Method**

At present, except for a small number of researches using case analysis methods, a large number of researches only focus on the level of theoretical discussion and summary based on general experience. There is little research with multi-perspective analysis, multi-disciplinary participation, and comprehensive application of multiple methods.

### **III. "Made in China 2025" and Research Trend of Transformation of Discipline Construction in Local Colleges**

In the background of development strategies that are formulated by Western developed countries such as "re-industrialization" and "return of manufacturing industry" and a new round of global competition triggered by the third industrial revolution, the launch of reform for higher education institutions and the introduction of the "Made in China 2025" provide a new perspective, opportunity and task for the study of discipline construction in local colleges. Therefore, seriously studying the relevant theoretical methods, institutional mechanism reform and realization approach of the transformation in local colleges has become a very urgent strategic research topic for discipline managers and the academic circle.

#### **3.1 Theory and Application for the Transformation of Discipline Construction in Local Colleges**

The core objective for the transformation of discipline construction in local colleges should be oriented by the transformation and upgrading of the industry, taking the transformation goals of the colleges as the guide based on the scientific and technological output, focusing on the achievement transformation, social services,

innovative and applied talents training to construct theoretical system, and systematically interpret the connotation and path of the disciplines transformation. The core issues that must be focused on are as following:

### **3.1.1 Scientific Understanding for the Functions and Values of Discipline Construction**

The talents training, scientific research and service society in colleges are not only the three main functions but also the value of discipline construction. At present, discipline construction builders and managers are oriented towards the construction of degree points and they attach more attention on academics and scientific research, but neglect the demand to cultivate innovative talents and carry out social service work in response to social needs so that value of discipline construction has not been effectively reflected. Implementing the transformation strategy of discipline construction are the need for colleges to fully realize the three basic functions, the need to build a discipline construction system for sustainable development, the inherent requirements for the comprehensive return of discipline construction value. The primary problems should be clearly understood by discipline builders and managers.

### **3.1.2 In-depth analysis for the transformation of discipline construction in local Colleges and the systematic nature of China's higher education reform**

From the perspective of system theory, any type of colleges are important parts of the national higher education system. The cooperation among the colleges has jointly constructed the higher education system in China. Similarly, different discipline types in colleges also constitute the discipline construction system of China and form different subject orientation according to the characteristics of social needs. High-level research universities should regard basic researches, high-level talents training, original innovation in high-tech fields, and services for the country's major social needs as the eternal pursuit. Local colleges should focus on applied researches, applied talents training and service for regional economy development. Therefore, discipline builders and managers should proceed from the national and regional economic, social and cultural needs, adapt to local conditions, the curriculum and conscientiously study the different disciplines, different regions, different levels of college disciplines, the current situation of construction and the future layout to establish a systematic, integrated and compatible construction plan with different levels of discipline construction, emphasis on social service orientation, different talents training objectives, different scientific and technological research contents.

### **3.1.3 Carrying out an in-depth Study on the Transformation of Discipline Construction in Local Colleges and Regional Development**

Local colleges are important parts of the development of a country, especially the regional society. The discipline construction in local colleges is not only influenced by the level of regional development, but also directly promotes regional development. It is an important support and key synergy factor for regional development and industrial restructuring. There are large number of small and medium-sized enterprises in China and many of them are shortage in technical talents with weak research, lack of development capabilities and relatively backward production processes. It is proposed by “Made in China 2025” that they are the targets of industrial adjustment and upgrading. The academic community should carry out detailed investigations and researches on the layout of key disciplines construction in local colleges, establish an index system for discipline organizations of local colleges to participate in personnel training, develop social services or cooperate with regional industrial organizations and establish relevant databases to analyze the level of discipline construction, the quality of talents training and social service efficiency to fully understand the fit of local key disciplines and regional economic development. The academic community should also formulate effective programs, promote local colleges to get rid of the self-construction, independent academic, neglect of synergy discourse system with industry, actively implement the transformation development strategy and reconstruct the discipline construction plan in local colleges to promote the adaptability of discipline construction with regional economic and social development. And more attention should be payed on the reinforce of applied researches, cultivation of innovative talents, and social services to form symbiosis and win-win situation with industrial organizations in the region.

### **3.2 The Approach for Transformation of Discipline Construction in Local Colleges**

Under the background of the local college transformation, discipline construction is the core driving force and central content, the source of intelligence for the innovative and applied talents training. It is also the main force for the development of social service work in colleges and the core indicator of current evaluation for local colleges' comprehensive school strength. Therefore, in-depth research on the approach of transformation of discipline construction are not only the basis and premise of the local college transformation but also an inevitable requirement for such colleges to achieve the goals of transformation and development.

### **3.2.1 Construct a Systematic Evaluation Plan to Promote the Transformation of Discipline Construction in Local Colleges**

Starting from the systematic construction of higher education, the typed orientation of the school-running model and the embedded development of national and regional needs, it is proposed to completely change the singular evaluation model for the level of college education and discipline construction. The comprehensive evaluation plan focusing on the innovative academy, quality of talents training and the level of social service should be established for training applied talents based on social demand and output-oriented results for the market. Systemic reform plan with fully embedding regional industrial structure adjustment, building new discipline construction system of five-in-one (politics, production, learning, research and use) should be constructed to guide the transformation of discipline construction in local colleges.

### **3.2.2 Promote the Three-in-one Construction Plan for Scientific Research, Talents Training and Social Services in Local Colleges**

Scientific researches, talents training and social service are the three basic functions that reflect the social value of the discipline. Discipline builders and managers should explore the ways to realize the social value of discipline construction in local colleges from the perspective of national and regional economic development needs, and study the Three-in-one construction plan for scientific researches, talents training and social services, based on applied researches, focusing on the transformation of results, aiming at application-oriented talents training and social services to promote the dynamic "coupling" relationship between scientific research and teaching, the quality of innovative and applied talents training and the formation of symbiotic relationship between disciplines and industrial organizations, so that colleges and enterprises can achieve a win-win situation in their respective fields of construction. And construction should be combined with independent innovation, collaborative innovation and drive innovation of discipline to form the basis of discipline independence, and strive for the elements of discipline self-improvement and sustainable development of the discipline.

### **3.3 Innovative Research Methods for Transformation of Discipline Construction in Local Colleges**

The researches on discipline construction are lack of data support in theoretical analysis. It is necessary to strengthen the innovation of research methods under the background of “Made in China 2025”, based on multidisciplinary and interdisciplinary participation in education, sociology, statistics, economics, management, by using comprehensive methods such as field research, literature review, questionnaire and survey research, special or random interview, case study, comparative research, empirical research combined with theoretical speculation, qualitative description combined with quantitative analysis, using modern information technology to collect data, establishing relevant databases and constructing adaptability database between local discipline construction and regional development, forming a series of research results for disciplines, which can provide foundation for the policy reform of discipline construction, the subject selection of discipline construction and the formulation of cooperation programs between related subjects.

## **IV. Conclusion**

The introduction of the "Made in China 2025" provides new opportunities and challenges for the transformation of discipline construction in local colleges. Discipline construction managers in local colleges should firmly grasp this historic turning point and focus on the transformation of local industrial structure, constructing a systematic theoretical framework for discipline construction, making up for the shortcomings of the application in academic research and the systematic theory construction to promote the research of discipline construction to a new level of theoretical deepening, achievement innovation and system construction. Discipline construction managers should promote the transformation of colleges based on discipline transformation and serve for adjustment of national and regional industry structure based on colleges transformation. The integrity plan of colleges development with regional development should be explored to eliminate alienation. The system and mechanism for the simultaneous development of the five-in-one, politics, production, learning, research and use should be constructed to fully exert the discipline intelligence, innovation achievements of local colleges, and they should upgrade the industrial structure of the service areas, provide constructive solutions for the discipline transformation of local colleges, theoretical and technical support for each discipline construction management department and the government's relevant policies formulation, cooperation plan for discipline construction, government and regional industry organization, constructive advice for discipline construction in local colleges, and improve relevant industries from “made in China” to “intelligent making in China”, from “manufacturing country” to “manufacturing power”.

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