

## **Research on the Diffusion of Innovation Within Higher Education: Case of Double First-rate Initiative in the Chinese Mainland**

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## Abstract

World-class university construction is a systematic and complex project led by the government with the purpose of constructing world-class universities or disciplines, and has far-reaching national strategic implications. In recent years, the academia has tried to analyse China's world-class university construction based on Support Alliance Theory, Multiple Streams Framework, Policy Tool Theory, and Process Reengineering Theory. Although domestic scholar has tried to use the Diffusion of Innovation Theory to study higher education policies in provincial administrative regions, the perspective only focuses on the mechanisms. As a significant innovation within higher education, the diffusion of Double First-rate Initiative in the Chinese Mainland refers to whether the policy can be promoted rationally and successfully. Based on the Diffusion of Innovation Theory, this research takes Double First-rate Initiative as a case, constructs a preliminary analysis framework for the diffusion of Double First-rate Initiative, and furtherly explores the fundamental pathways, affecting factors and important mechanisms. Findings reveal that the diffusion of Double First-rate Initiative can be explained by the Diffusion of Innovation Theory; shows uniqueness in the time, spatial and organisational dimensions; implies horizontal, vertical and multidirectional diffusion mechanisms; is affected by factors such as motivation, resource, external environment and policy attribute.

Key words: public policy; world-class university; Double First-rate Initiative; Diffusion of Innovation Theory; mechanism

## 1. Introduction

World-class university construction is a systematic and complex project led by the government with the purpose of constructing world-class universities or disciplines, and has far-reaching national strategic implications. The Chinese central government has successively implemented 211 Project, 985 Project, 2011 Plan and Double First-rate Initiative, and is committed to constructing world-class universities and first-class disciplines. 211 Project was officially launched in 1995 after approval by the State Council of PRC. 211 Project refers to the construction of about 112 colleges and universities and a number of key disciplines in the 21<sup>st</sup> century. 985 Project was officially launched in 1998. In May 1998, the Ministry of Education of PRC decided to support the construction of world-class universities and high-level universities in Peking University, Tsinghua University and other universities in the implementation of the *Action Plan for Revitalizing Education in the 21st Century*, in order to implement the CPC's strategy of rejuvenating the country through science and education.

On April 24, 2011, Hu Jintao, General Secretary of the Central Committee of CPC and President of PRC, put forward the concept and requirements of promoting collaborative innovation when he delivered a speech at the centennial anniversary of Tsinghua University. In order to implement the spirit of Hu's important speech, the Ministry of Education and the Ministry of Finance of PRC jointly held a working meeting on May 7, 2012, officially launched the implementation of the *Institutions of higher learning innovation ability enhancement* (hereinafter referred to as 2011 Plan). 2011 Plan is another major strategy that reflects the national will after the 211 Project and 985 Pro-

ject. The implementation of this project is a strategic measure and a practical need to promote the intensive development of higher education, and a major action to deepen the reform of scientific and technological system.

The construction of world-class universities and first-rate disciplines (hereinafter referred to as Double First-rate Initiative) was a crucial measure taken by the Chinese government in October 2015, to improve higher education after 211 Project and 985 Project, and to ensure that the nation becomes rich in human-resource potential. It is also relevant to enhancing the country's core competitiveness internationally and to achieve its modernization goals. The implementation of Double First-rate Initiative is fully compatible with China's economic and social development and the demand for talents to play a central role in spearheading the country's growth. Currently, Colleges and universities involving Double First-rate Initiative are composed of 42 colleges and universities which aim at constructing world-class universities, and 95 colleges and universities which aim at constructing First-rate disciplines.

Policy changes urgently require the academia to explore the academic foundation of public education policy analysis, and gradually increase the rational recognition of public education policy. At present, on the one hand, with regard to the research on the promotion of world-class university construction, academia is mostly based on text analysis method, following the logic of historical evolution, forming induction and summary of practical experience, but lacking a scientific theoretical analysis framework; on the other hand, existing studies often lack an effective analysis framework. With the in-depth study of related topics, research perspectives and methods are also expanding.

In recent years, the academia has tried to analyse China's world-class university construction based on Support Alliance Theory, Multiple Streams Framework, Policy Tool Theory, and Process Reengineering Theory. Although domestic scholar has tried to use the Diffusion of Innovation Theory to study higher education policies in provincial administrative regions [1], the perspective only focuses on the mechanisms. Based on the existing research, this research attempts to take the Double First-rate Initiative as a case, analyse the fundamental pathways, influencing factors and important mechanisms, providing a reference for the implementation of similar higher education initiatives throughout the world.

## 2. Theoretical framework

### 2.1 Overview of Diffusion of Innovation Theory and its applicability

#### (1) Overview of theory

In 1969, Jack L. Walker published a paper on the issue of policy innovation diffusion, which triggered the academia to study policy innovation diffusion issues over past more than half century and made policy innovation diffusion an important research field in policy science. Innovation refers to the policy or project adopted by the government for the first time, no matter how long the policy or project appears, or whether other governments have already adopted it, and the policy or project is adopted by governments at different levels and in different regions [2]. Diffusion, according to the

classic definition of Everett M. Rogers, refers to a process of innovation communication, including a new idea over time in the social system communication [3], in other words, refers to the process in which governments at different levels or regions have successively adopted a policy. Diffusion of policy innovation refers to the process of policy innovation being spread and adopted among governments and organisations through a certain channel over a period of time [4]. At present, the research scope of the Diffusion of Innovation Theory is not limited to the diffusion of innovation under the developed countries or federal system. It also begins to explore the diffusion of innovation under the developing countries or unitary system.

## (2) Theoretical review

Is the Diffusion of Innovation Theory applicable to this research? The following two questions need to make a clear response. First, will the Diffusion of Innovation Theory originated in the West produce a rejection reaction in China? In the United States, the diffusion of innovation is often manifested as a *horizontal transfer model* among state governments, while the diffusion of innovation in China is often manifested as a *pilot-promotion model* driven by the central government. However, the Diffusion of Innovation Theory is beginning to focus on exploring the promotion of policies in the developing countries. With the increasing diversity of policy influencing factors and the increasing complexity of implementation, the Diffusion of Innovation Theory has increasingly broken through the limitations of regions and contexts, and has increasingly demonstrated the homogeneity in the context of globalization. Therefore, this research believes that the Diffusion of Innovation Theory helps to study the Chinese policy system, on the basis of clarifying the Diffusion of Innovation Theory system and grasping the diffusion mechanisms.

Secondly, is the Diffusion of Innovation Theory applicable to analyse world-class university initiative in the Chinese Mainland? The diffusion of educational innovation in the Chinese Mainland often has a compelling trait in the past. With the gradual integration of governance philosophy in the field of organisation and management, the thought of good governance with the qualities of cooperation, dialogue, sharing and coordination is being gradually adopted. The role of the traditional decision-making model of mandatory command-passive acceptance is gradually declining. The Double First-rate Initiative is a significant strategic decision made by the Central Committee of CPC and the State Council of PRC. Over the past four years, it has shown unique characteristics different from previous higher educational policies. The Diffusion of Innovation Theory, to some extent, can be introduced.

### 2.2 Analysis model of the diffusion of “Double First-rate” Initiative

Frances S. Berry and William D. Berry (1990) integrated the internal decision-making model and external diffusion model, and proposed an integrated diffusion of innovation model. The model has become a mainstream model of diffusion of innovation in the West for a long time. This research revises the Berry’s diffusion of innovation model, expands the connotation of influencing factors and mechanism factors, and tries to construct an analysis model of the diffusion of Double First-rate Initiative (see Figure 1).

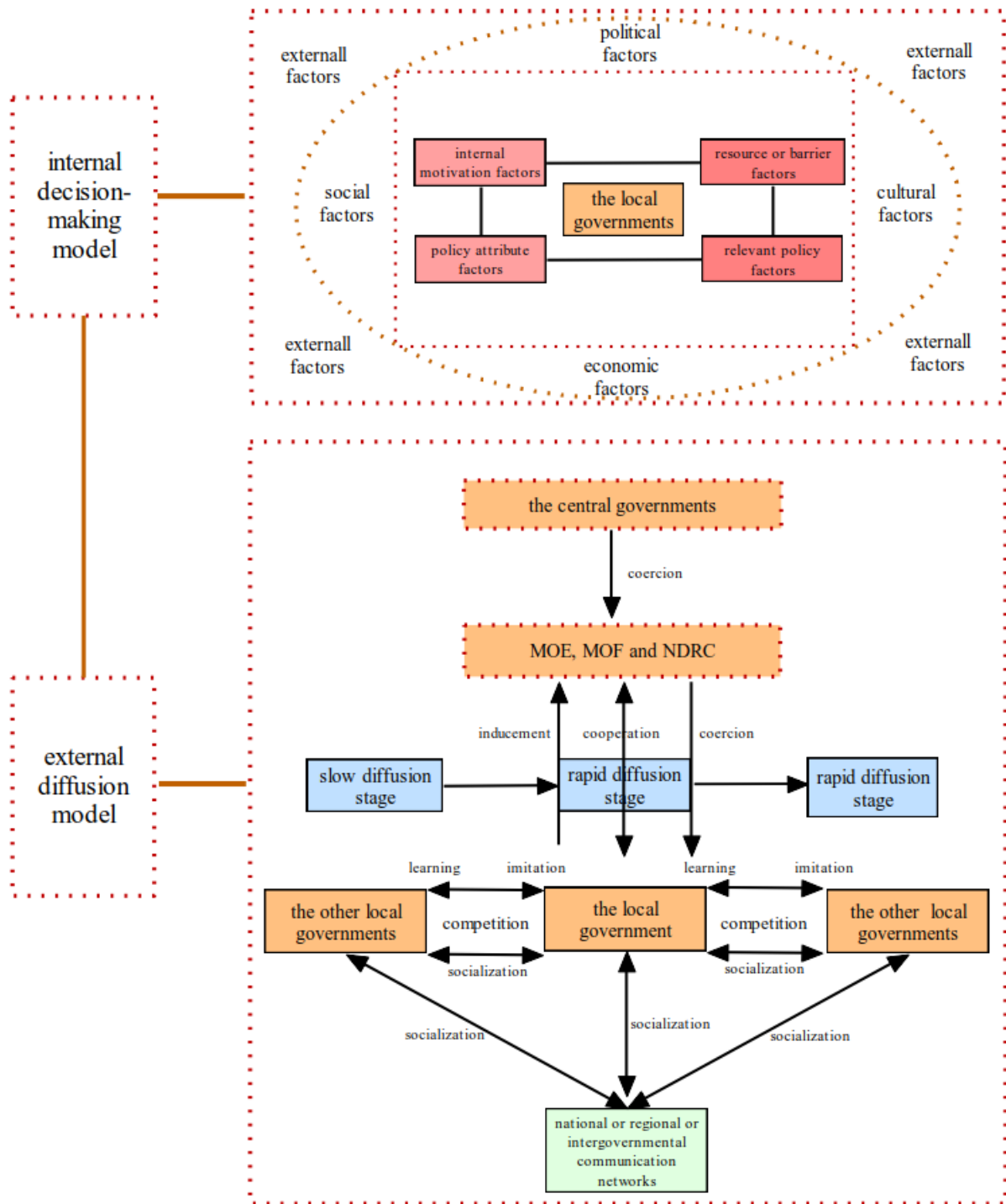


Figure 1 Preliminary Analysis Framework for the Diffusion of Double First-rate Initiative

The advancement of the Double First-rate Initiative is complex and unique, covering both internal decision-making model and external diffusion model. In the internal decision-making model, local governments fully consider the political factors, cultural factors, economic factors and social factors, under the influence of internal motivation factors, resource or barrier factors, relevant policy factors and policy attribute factors based on global development trends and domestic realities, so as to make decisions to adopt and follow the policy of coordinating the construction of world-class uni-

versities and first-rate disciplines. In the external diffusion model, there are several operating mechanisms embedded between the central government and various ministries, between ministries and local governments, between local governments, between local governments and various exchange networks. The slow diffusion, rapid diffusion and steady diffusion stages are successively experienced, and finally the diffusion of innovation is completed.

This research believes that the diffusion of Double First-rate Initiative mainly includes seven mechanisms: learning mechanism, competition mechanism, imitation mechanism, coercion mechanism, cooperation mechanism, inducement mechanism and socialization mechanism. It relies on the following basic logic: The Central Committee of CPC and the State Council of PRC issued a mandatory the *Overall Plan for Integrating and Promoting the Construction of World-class class Universities and First-class Disciplines* (hereinafter referred to as Overall Plan) by the the Ministry of Education of PRC (hereinafter referred to as MOE), the Ministry of Finance of PRC (hereinafter referred to as MOF), and the National Development and Reform Commission of PRC (hereinafter referred to as NDRC) through a mandatory mechanism, which is mandatory and plays a guiding role for the policy innovation adoption of local governments (province, autonomous regions, and municipalities); individual local governments have an indirect impact on the policy innovation adoption of central government through inducement mechanism; individual local governments and the Ministry of Education have strengthened the diffusion of local government policy innovation through cooperation mechanism; local governments play a role in the diffusion of policy innovation by adopting learning mechanisms, competition mechanism and the imitation mechanism; national or regional or intergovernmental communication networks affect the diffusion of innovation of local governments through socialization mechanism, which in turn triggers local governments to jointly realise the isomorphic process of socialization of Double First-rate Initiative.

### 3. Research Methodology

#### 3.1 Literature analysis

This research intends to comprehensively collect and review the literature materials about Double First-rate Initiative, analyse and discuss the historical background, implementation and issues of Double First-rate Initiative in the Chinese Mainland. Specifically, this research collects policy text and regulations, summary report, meeting materials. In order to comprehensively and objectively reflect the practice of Double First-rate Initiative, this research relies on the Construction Schemes, Opinions or Measures of Double First-rate Initiative released by the local governments, related research literature including relevant research papers, research reports since 2015, etc., data from the official website of colleges and universities, news reports.

#### 3.2 Case study

In order to improve the explanatory power and persuasiveness, this research mainly adopts the Case Study method, an important method in the field of social sciences. As of December 2018, except for the Tibet Autonomous Region, the governments of the 30 provincial administrative regions including provinces, autonomous regions and municipalities in the Chinese Mainland have announced Construction Schemes, Opinions or Measures, basically completing the diffusion of Double

First-rate Initiative. Multiple cases of Double First-rate Initiative are selected for in-depth analysis in this research to demonstrate the fundamental diffusion pathways, important mechanisms and influencing factors.

#### 4. Analysis and findings

##### 4.1 The fundamental diffusion pathways of Double First-rate Initiative

According to the Diffusion of Innovation Theory, diffusion pathways of innovation refer to the unique model of policy innovation diffusion in the spatial dimension, time dimension and organisational dimension [5]. This research focuses on the time, spatial and organisational dimensions, and analyses the fundamental diffusion pathways of “Double First-rate” Initiative.

###### (1) Time dimension

After conducting systematic research on more than 3,000 diffusion cases of innovations, Rogers proposed the famous S-curve. Over time, policy diffusion often experiences slow diffusion stage, rapid diffusion stage and stable diffusion stage. If the cumulative number of policies adopted in each stage is expressed as a dot chart, it will show the S-curve [5]. In order to grasp the distribution characteristics of diffusion activities as a whole, this research draws a diffusion curve in months (see Figure 2). The horizontal axis represents the time when the Double First-rate Initiative policy document was issued, and the vertical axis is the number of Double First-rate Initiative adopted and issued by provincial governments each month (where the blue broken line indicates that the provincial government adopted and issued Double First-rate Initiative policies; the red broken line indicates the cumulative number of Double First-rate Initiative policies adopted and issued by the provincial governments in a given month).

On October 24, 2015, the State Council issued the Overall Plan. Since then, the local governments have issued Schemes or Opinions or Measures for the Double First-rate Initiative in the region. The formulation and promulgation agencies of Double First-rate Initiative in various regions mainly include the following types: the General Office of Provincial Committee of CPC; the General Office of Provincial or Municipal or Autonomous Region People’s Government; Provincial or Municipal or Autonomous Region People’s Government; Provincial Department of Education or Autonomous Regions, or Municipal Education Commission; Provincial or Autonomous Regions Department of Finance, etc. [6].

Figure 2 visually shows the diffusion trend of Double First-rate Initiative among provincial governments. The diffusion of Double First-rate Initiative basically conforms to the S-curve trend which is not a typical S-curve. According to the trend reflected in the diffusion curve, this research divides the diffusion of Double First-rate Initiative among local governments into slow diffusion stage (from October 2015 to November 2016), rapid diffusion stage (from December 2016 to November 2017) and steady diffusion stage (from December 2017 to December 2018).

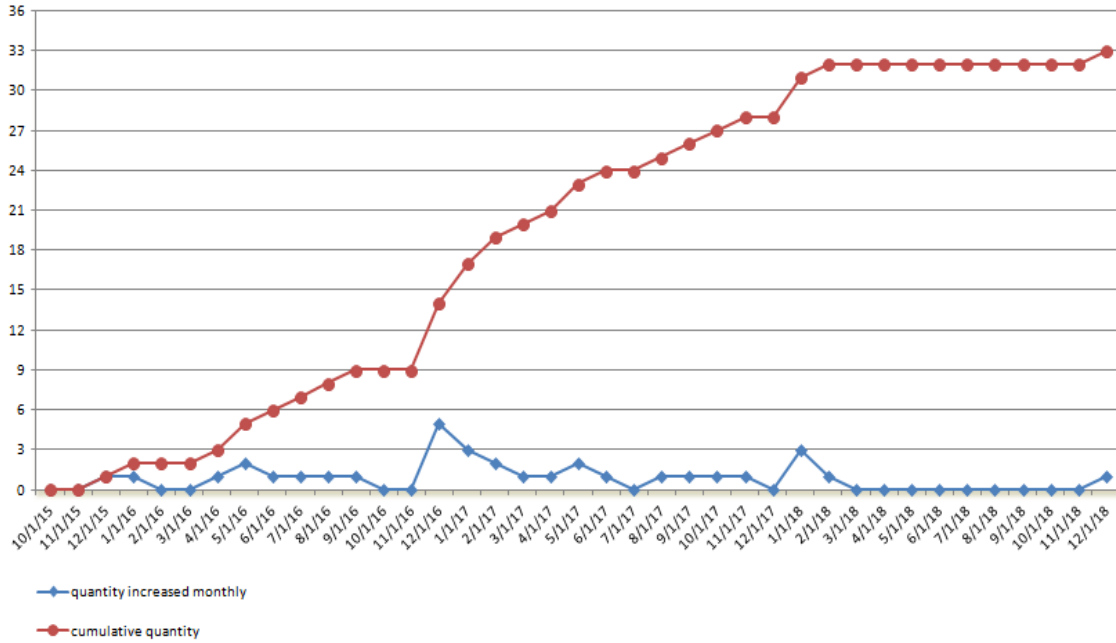


Figure2 Diffusion Trend of Double First-rate Initiative among Provincial Governments

### The first stage: slow diffusion stage

On October 24, 2015, the State Council issued the Overall Plan. The Overall Plan stipulated strengthening organisation management and orderly promoting implementation [7]. During this stage, the Double First-rate Initiative showed a slow diffusion trend, and only a few local governments took actions to release the implementation schemes of Double First-rate Initiative. On December 8, 2015, the Henan Provincial Department of Education and the Department of Finance announced the *Implementation Plan of Henan Province's Advantageous Discipline Construction Project*. Henan Province became the earliest local government to announce the implementation scheme of Double First-rate Initiative, while most local governments didn't respond actively but take a wait-and-see attitude. From October 2015 to December 2016, a total of 9 provincial governments and autonomous regions announced Schemes or Opinions. To a large extent, the slow tendency of diffusion was affected by the operability of "Overall Plan", the scientificity of overall design, and the accessibility of overall goals.

### The second stage: rapid diffusion stage

On January 24, 2017, the MOE, MOF and NDRC jointly issued the *Overall Implementation Measures for Promoting the Construction of World-class Universities and First-class Disciplines (Interim)* (hereinafter referred to as the "Implementation Measures"). The Implementation Measures stipulated that provincial people's governments should combine economic and social development needs and basic conditions to coordinate and promote the construction of distinctive high-level universities and superior disciplines in the regions [8]. On March 21, 2019, MOE, MOF and NDRC jointly announced the list of Double First-rate Initiative, which indicated that the initiative entered a new stage of development. From the promulgation of the Overall Plan to the promulgation of Im-



plementation Measures and the publication of Double First-rate Initiative list, it took only one year and eleven months, which showed the firm belief of implementing strategic deployment and uncompromising execution of the Central Committee of CPC, State Council of PRC. During this stage, the Double First-rate Initiative showed a rapid diffusion trend. From December 2016 to November 2017, a total of 19 provincial governments announced their Construction Schemes or Opinions.

The third stage: stable diffusion stage

On August 8, 2018, MOE, MOF and NDRC jointly issued the *Guiding Opinions on Accelerating the Double First-rate Initiative in Colleges and Universities* (hereinafter referred to as Guiding Opinions). The Guiding Opinions stipulated forming a joint force of the Double First-rate Initiative [9]. From September 28 to 29, 2018, the Ministry of Education held an on-site promotion meeting for the Double First-rate Initiative in Shanghai [10]. During this stage, the Double First-rate Initiative showed a stable diffusion trend. As of December 2018, except for the Tibet Autonomous Region, the governments of the 30 provincial administrative regions including provinces, autonomous regions and municipalities in the Chinese Mainland have announced Construction Schemes, Opinions or Measures, basically completing the diffusion of Double First-rate Initiative. From December 2017 to December 2018, a total of 4 provincial governments including Hubei, Yunnan, Shanghai and Beijing announced Construction Schemes or Opinions. At different diffusion stages of the Double First-rate Initiative, local governments have adopted different action plans and strategic measures.

(2) Spatial dimension

According to the Diffusion of Innovation Theory, the diffusion of innovation will produce a proximity effect, which means that policy learning at the horizontal level often occurs because of more contact and interaction between geographically adjacent or neighboring governments [11]. From the perspective of space, both the initial diffusion stage of the Double First-rate Initiative and the stable diffusion stage have the characteristic of typical proximity effect; however, with the deepening of the diffusion, especially at the rapid diffusion stage, it gradually exhibits the significant characteristic of proximity effect and presents the phenomenon of agglomeration by region. This research has extracted five areas with significant proximity effect: Area A, including Inner Mongolia Autonomous Region, Hebei, Gansu, Shaanxi and Xinjiang Uygur Autonomous Region; Area B, including Hubei and Anhui; Area C, including Fujian and Jiangxi; Area D, including Liaoning, Jilin and Heilongjiang; Area E, including Sichuan and Yunnan. The local provincial governments in various regions not only have close geographic space and similar economic development levels, but also have common regional development appeals. In addition, it is worth noting that the diffusion of Double First-rate Initiative has not exhibited the traditional diffusion model, i.e., the eastern coastal areas lead while the central and western areas follow up. Some central and western provinces show a high-level enthusiasm in the diffusion of Double First-rate Initiative.

(3) Organisational dimension

At present, the top-down hierarchical diffusion model is the mainstream diffusion model of public

policy innovation in China. Because of the order and obedience of administrative power between the upper and lower-level of governments, the policy promoters select and adopt a policy, and use the administrative instructions to require the lower-level governments to adopt and implement the policy, policy innovation is quickly spread to the lower-level governments and related departments [5]. From the organisational perspective, the diffusion of Double First-rate Initiative is a typical top-down hierarchy diffusion model, but in the process of practical advancement, it followed the path from level diffusion to local pilot, and to full implementation.

The Central Committee of CPC and the State Council of PRC convey the spirit in top-down form to the relevant departments in the form of a red head document (i.e. Overall Plan); MOE, MOF and NDRC, as relevant leading departments, are responsible for planning and deploying, promoting implementation, supervision and management, and conveying the spirit to the local people's governments of provinces, municipalities, and autonomous regions by establishing an inter-ministerial coordination mechanism; local party committees of CPC and governments of various provinces, municipalities, and autonomous regions learn and understand the spirit of Overall Plan, start to initiate the local policy agenda and introduce local Schemes or Opinions or Measures; the educational departments of all provinces, municipalities and autonomous regions actively respond to the instructions of the state and superior governments and actively implement them.

Taking Jiangsu Province as an example, the Jiangsu Provincial Committee of CPC and Jiangsu Provincial People's Government attach great importance to the Double First-rate Initiative. On April 5, 2017, the General Office of Jiangsu Provincial Government issued the *Implementation Measures for the Construction of Jiangsu High-level Universities (Interim)* which stipulated that the Steering Group for the Reform of Education System of Jiangsu Province is responsible for the overall coordination, funding, and performance evaluation of the construction of high-level universities. As making decisions on important matters, the office of the leading group and the member units shall be responsible, coordinate and supervise [12]. The leader of steering group was assumed by a vice governor of the province. On January 26, 2018, the *2018 Work Report of Jiangsu Provincial Government* stated that it is required to increase investment and accelerate the construction of first-class universities and first-class disciplines [13].

In November 2018, Jiangsu Province seized the opportunity of promoting a joint construction of Double First-rate Initiative between province and MOE, officially jointly issued the *Opinions on the Joint Construction of 13 Double First-rate Universities*. On January 14, 2019, the *2019 Work Report of Jiangsu Provincial Government* stated that it is required to accelerate the construction of Double First-rate and high-level universities to promote the intensive development of higher education [14]. On February 1, 2019, The General Office of the Jiangsu Provincial People's Government issued the *Implementation Opinions of the General Office of the Provincial Government on Further Adjusting and Optimizing the Structure and Increasing the Benefits of Using Education Funds*, stating that it is required to optimize the structure of higher education expenditures, support the Double First-rate Initiative, and implement the high-level university construction project and characteristic University construction [15]. Under the guidance of Jiangsu Provincial Committee of CPC and Jiangsu Provincial People's Government, the Working Committee on Education of Jiangsu Provincial Committee of CPC, Jiangsu Provincial Department of Education has effectively carried out the

Double First-rate Initiative and high-level universities construction [16][17].

#### 4.2 The important mechanisms of the diffusion of Double First-rate Initiative

According to the Diffusion of Innovation Theory, the policy innovation diffusion mechanisms mainly include horizontal diffusion mechanisms and vertical diffusion mechanisms. As far as the Double First-rate Initiative is concerned, this research believes that its black box of diffusion is nested in a complex process in which various mechanisms work together. As a policy promulgated by the central government of a unitary system, not only does the central government have a compulsory influence on local governments based on the coercive mechanism, but also a variety of other mechanisms, i.e. horizontal diffusion mechanisms including learning mechanism, imitation mechanism and competition mechanism; vertical diffusion mechanisms including coercive mechanism, inducement mechanism and cooperation mechanism; multidirectional diffusion mechanisms including socialized mechanism.

##### (1) Horizontal mechanisms

###### Learning mechanism

According to the Diffusion of Innovation Theory, learning refers to policy-makers learn the successful policy experience by observing the existing policy selection process and policy results, and find effective policies to solve problems [18]. According to the logic or way of learning, learning includes learning with full ration and learning with limited ration [4]. In the process of advancing the Double First-rate Initiative, the learning mechanism is a core mechanism. Some local governments have become the forerunners of policies because of their relatively strong economic strength, and in-depth policy learning, which provides references for other provinces, municipalities and autonomous regions to formulate the Construction Schemes of Double First-rate Initiative. The other local governments learn rationally and prudently the lesson of provinces which adopted policy innovations.

Specifically, the learning mechanism mainly includes the learning of construction scheme and construction practice. The learning mechanism of construction scheme includes the following ways. The first way is to learn the construction ideas. For example, the Chongqing Municipal Education Commission has stated that it will explore the concept of its own construction scheme on the basis of fully learning the Construction Scheme of Double First-rate Initiative in Jiangsu, Guangdong and other provinces [17] [19]. The second way is to learn the construction process. For example, in the Construction Scheme of Double First-rate Initiative in Guangdong Province, 2020 and 2030 are the important nodes of Double First-rate Initiative, and Shandong, Hubei, Fujian and other provinces also take the nodes as a reference [18] [20]. The final way is to learn the construction content. For example, the Construction Scheme of Double First-rate Initiative in Zhejiang Province and the Construction Scheme of Universities and Disciplines Development in Shanghai have inspired many provincial governments to develop the Construction Scheme of Double First-rate Initiative [1]. In addition to the learning mechanism of construction scheme, there is also learning mechanism of construction practice based on various meetings of experience exchange.

## Competition mechanism

According to the Diffusion of Innovation Theory, competition refers to that policy-makers consider the economic effects of other governments adopting or not adopting a certain policy, and tend to adopt policies that can bring positive economic effects to themselves [20]. In the process of advancing the Double First-rate Initiative, the competition mechanism is also an important mechanism. The provincial governments, as the executor of national strategic decision and the promoter of the first-class universities construction, have played the role of linking the central government and local governments. In order to improve the comprehensive strength of regional higher education and attain competitive position in Double First-rate Initiative, the provincial governments have developed the following competitive strategies. The first competitive strategy is to form a competitive advantage of planning by coordinating the development pattern of higher education. The second competitive strategy is to form a competitive advantage of organisation by innovating collaborative governance mechanisms. The third competitive strategy is to form a competitive advantage of finance by increasing capital investment. The fourth competitive strategy is to form competitive advantage of talent by introducing excellent human resources. The fifth competitive strategy is to form competitive advantage by exploring different development models. There are differences in the degree of policy innovation between provinces. Individualized characteristics are reflected in policy innovation planning and measures.

## Imitation mechanism

According to the Diffusion of Innovation Theory, imitation refers to that policy-makers copy other government's policy models in order to improve the legitimacy of policy choices [18]. The degree of imitation reflects the actor's desire and need of following universal standards. In the process of advancing the Double First-rate Initiative, the imitation mechanism is also a relatively common mechanism. For example, Guangdong Province clearly requires that key universities should actively compare with the top ranked universities of the same type in the construction of high-level universities. Anhui Province clearly states that colleges and universities should be based on their own position and take top ranked universities at home and abroad as benchmarks [21]. In the process of Double First-rate Initiative, the imitation mechanism not only exists widely between the adjacent regions based on the proximity effect, but also exists between the developed regions along the eastern coast and the less developed central and western regions.

## (2) Vertical mechanisms

### Enforcement mechanism

According to the Diffusion of Innovation Theory, mandatory refers to the behavior of certain political activists attempting to impose the policies they admire on another government [18]. Coercion mainly comes from the pressure of higher-level governments, including incentives, pressures, and mandatory requirements [4]. The diffusion of Double First-rate Initiative follows the logic which is dominated by the parallel of administrative directives and economic incentives, and supplemented by simplified administration and decentralization. The Overall Plan released in 2015 clearly proposed that the construction of first-class universities and first-class disciplines in local universities

should be promoted by the local governments according to the reality. The Implementation Measures issued in 2017 and the Guiding Opinions issued in 2018 further refined the construction goals and guidelines. A legal power has been formed to force the provincial governments to issue the Construction Scheme of Double First-rate Initiative as soon as possible. Among them, the policy tools used in the Overall Plan refer to mandatory, voluntary and mixed policy tools. According to a quantitative analysis, the frequency of mandatory policy tools is as high as 59 times, accounting for 76.62%; among the mandatory policy tools, command and authoritative tools are used most frequently, up to 59.32% [22].

### Cooperation mechanism

In the existing research on Diffusion of Innovation Theory, the cooperation mechanism has never been discussed. This research believes that cooperation refers to the process in which the actor actively builds a channel of collaborative cooperation with the superior government in order to seek the resources and policy support. At present, the Ministry of Education has signed the joint construction agreements of Double First-rate Initiative with the people's governments of provinces or municipalities such as Shanghai, Hubei, Guangdong, Zhejiang and Hunan, strengthened the guidance and support for the local colleges and universities involving Double First-rate Initiative, and promoted the intensive development of higher education [23]. The joint construction mechanism between the Ministry of Education and provinces is forming a coordinating force for world-class universities construction in each region. For instance, Zhejiang Province has established a joint construction mechanism of Double First-rate Initiative through active communication and multiple collaborations [24].

### Inducement mechanism

According to the Diffusion of Innovation Theory, inducement refers to the process of lower-level government policy innovation's first-mover benefit stimulating the higher government or the central government to adopt new policies [4]. At present, in the diffusion of Double First-rate Initiative, the role of the inducement mechanism is not a common phenomenon. The pilot programs of key disciplines in pioneer provinces may have a certain degree of influence on the central government's decision-making. Although there is not enough evidence to show how inducement mechanism is transmitted from the local governments to the central government, the leading role of policies in eastern coastal provinces such as Guangdong and Zhejiang cannot be ignored. Before the Central Committee of CPC and the State Council of PRC formally promulgated the Overall Plan, first-class universities or first-class disciplines construction policies in Shanghai, Zhejiang and other regions were formed, providing references for the central government to issue a "Double First-rate" Construction policy.

### (3) Multi-directional mechanism

According to the Diffusion of Innovation Theory, socialization refers to the process by which policy-makers recognize certain norms and concepts [18]. In the process of advancing the Double First-rate Initiative, the socialization mechanism is not negligible. Through various communication

platforms between local governments, local governments and national or regional networks, the value judgment of Double First-rate Initiative is formed, and the understanding of policy norms and concepts is gradually deepened to complete the isomorphic process of socialization. The socialization mechanism is a multi-directional diffusion mechanism combining vertical and horizontal directions. The main forms of socialization mechanism include holding various types of academic conferences about Double First-rate Initiative at all levels, establishing various types of alliance organisations of Double First-rate Initiative, and conducting various types of researches of Double First-rate Initiative. In the process of Double First-rate Construction, different local governments often integrate multiple channels to form socialization mechanism. For example, Zhejiang Province has seized opportunities to establish a Double First-rate Construction socialization mechanism. The top-down ideological co-ordination and guidance of the Provincial Committee of CPC has greatly enhanced the missionary awareness of colleges and universities involving Double First-rate Initiative [25]. Secondly, it actively undertakes national education conferences and strives to improve the first-rate quality of provincial colleges and universities.

#### 4.3 The Influencing factors of the diffusion of Double First-rate Initiative

According to the Diffusion of Innovation Theory, the factors that influence on the diffusion of innovation mainly include motivation, resources, other policies, external factors and policy attributes. Due to the limited space, this research only focuses on motivation factors, resource factors, and policy factors.

##### (1) Motivation factors

Motivation is an internal motive that motivates and maintains human action and directs the action to a certain goal [4]. In order to maximize the benefits, local governments actively participate in competition in the field of higher education. In the process of Double First-rate Construction, the implicit political and economic competition has become the main motive for local government participation. First, the economic competition is a fundamental driving force. At present, the dependence of economic and social development of various provinces on higher education has become increasingly prominent, driving local governments to actively participate in the Double First-rate Initiative. Secondly, the political competition is an important driving force. There is an important phenomenon in the relationship between governments organisation with a single system in China, that is, local governments lead competition in jurisdictions and seek to maximize regional interests [26]. In order to gain an advantageous position in the competition for political achievements, local governments have attached great importance to the Double First-rate Initiative and launched fierce competition for this purpose.

##### (2) Resource factors

In the process of Double First-rate Construction, government governance style, financial supply capacity, and higher education development level have become the main resource factors for local government participation. First, in the process of advancing the Double First-rate Initiative, the local governments show different governance style including it's the emphasis on national strategic planning, self-confidence of government governance level, the ability to perceive national policies,

and the ability to coordinate policy formulation. Secondly, as one of the suppliers of special financial funds for the Double First-rate Initiative, the financial supply capacity of local governments directly restrict its progress in adopting the innovation of the Double First-rate Initiative. There are differences in the financial supply capacity of local governments, which will also directly affect their response speed to the adoption of Double First-rate Initiative. Thirdly, the overall development level of higher education in the region directly affects its urgency for the adoption of Double First-rate Initiative. Regions with relatively poor higher education resources have more obvious enthusiasm in adopting Double First-rate Initiative, and look forward to driving the overall development of higher education in the region with a more urgent subjective desire. Regions with relatively rich higher education resources are looking forward to adopting the Double First-rate Initiative to lead the intensive development of higher education in the region.

### (3) Policy factors

According to the Diffusion of Innovation Theory, innovation has five attributes: relative advantage, compatibility, complexity, observability, and trialability [27]. This research believes that the innovation of Double First-rate Initiative has three attributes, i.e. superiority, compatibility and complexity.

#### Superiority

The Double First-rate Initiative is a major strategic adjustments and strategic layout which is based on the nationalism model and promoted in top-down form [28]. The Double First-rate Initiative is not only a policy goal, but also an educational practice activity, a policy process based on Chinese characteristics, a coordinated progress of universities and disciplines.

#### Compatibility

The Double First-rate Initiative is a product of history, and there is a problem of compatibility with the policies of central government and local governments. The first issue is the compatibility with the policies of central government's key higher education project. The second issue is the compatibility with the local government's policies for the construction of key higher education projects. Prior to the release of the Overall Plan, Shanghai, Guangdong, Zhejiang, Jiangsu and other provinces and cities had already issued relevant policy documents. Although they mentioned connecting or benchmarking after the release of the Overall Plan, how to effectively coordinate national and regional policies has become a planning problem in front of local governments.

#### Complexity

The Overall Plan provides the possibility of Double First-rate Initiative from the top-level design, but there are still many difficulties in practice that restrict the innovation and adoption of the Double First-rate Initiative: the policy objectives and specific construction tasks are ambiguous; the policy implementation plan is not clear; policy evaluation plan lacks. In addition, the plan also lacks a clear definition of core concepts such as what is a world-class university and what is a first-class discipline.

## 5. Concluding remarks

This research mainly draws the following conclusions.

First, the theoretical achievements of Diffusion of Innovation Theory provide a perspective for the research on the promotion of Double First-rate Initiative. With the increasing diversity of policy influencing factors and the increasing complexity of the implementation process, the Diffusion of Innovation Theory has increasingly broken through the limitations of regions and contexts, and has increasingly demonstrated the homogeneity in the context of globalization. The Double First-rate Initiative is a major strategic decision made by the Central Committee of CPC and the State Council of PRC, and has shown new characteristics different from the previous policies, which provides the possibility for the application of Diffusion of Innovation Theory.

Secondly, the diffusion of Double First-rate Initiative is complex, and can be explained using internal decision-making and the overall model of external diffusion. In the internal decision-making model, local governments fully consider the political factors, cultural factors, economic factors and social factors, under the influence of internal motivation factors, resource or barrier factors, relevant policy factors and policy attribute factors. In the external diffusion model, there are several operating mechanisms embedded between the central government and various ministries, between ministries and local governments, between local governments, between local governments and various exchange networks.

Thirdly, the diffusion of Double First-rate Initiative reflects uniqueness in the time, spatial and organisational dimensions. In terms of time dimension, the diffusion of Double First-rate Initiative among provincial governments is not a typical S-curve. The diffusion of Double First-rate Initiative among local governments is divided into slow diffusion stage, fast diffusion stage and stable diffusion stage.

Fourthly, the diffusion of Double First-rate Initiative implies multiple mechanisms such as horizontal diffusion, vertical diffusion and multidirectional diffusion. The horizontal diffusion mechanisms include learning mechanism, competition mechanism and imitation mechanism. The vertical diffusion mechanisms include mandatory mechanism, cooperation mechanism and inducement mechanism. The multi-directional diffusion mechanism mainly includes socialization mechanism.

Fifthly, the diffusion of Double First-rate Initiative is affected by factors such as motivation, resources, external environment and policy attributes. In terms of motivation factors, there are two main motivations of political and economic competition. In terms of policy factors, the policy innovation of Double First-rate Initiative has three attributes, i.e. superiority, compatibility and complexity.

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