Necessity and Oughtness: *The "Double Innovation" Education Mode for Graduate Students in the Multimedia Era*

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***Abstract*—The reform of the "Double Innovation" education mode for graduate students in the multimedia era reflects the direction of striving for the main battlefield of the national economy and the forefront of world technology, combining personal practical exploration with the process of human civilization, and achieving overall coordination and dynamic balance among various training elements. The necessity and oughtness aspects of graduate "Double Innovation" education in the multimedia era are discussed to achieve the unity of theory and practice in its model reform. By analyzing the inherent connection between social and technological development in the multimedia era and graduate entrepreneurship education, the inevitability and certainty of graduate entrepreneurship education reform are presented in the paper to derive its "Double Innovation" education system.**

***Keywords*—"Double Innovation" graduate education mode, multimedia era, education mode for graduate students**

I. Introduction

The development of technology has pushed forward a historical opportunity period of innovation climax: smart healthcare, smart education, smart cities, smart factories, smart transportation etc., and innovation has become the first driving force for development. Comprehensively promoting entrepreneurship education in universities has become a new driving force for cultivating and promoting economic and social development [1]. In the multimedia era, respecting science and continuous innovation remain powerful support for humanity to face unknown difficulties and challenges. The vigorous development of innovation and entrepreneurship education has profound significance. As a technology reserve and fresh troops, graduate students undertake more missions and responsibilities for carrying the hope of the country and the nation to embark on a new journey in the multimedia era. So it is urgent and necessary to develop teaching methods to cultivate graduate students with high-quality composite talents, global perspective, innovative spirit, practical ability, and humanistic care consciousness.

"Double Innovation" means innovation and entrepreneurship, which has become increasingly important across all technical sectors, and aims to cultivate talents with basic entrepreneurial qualities and innovative personalities. It is not only aimed at cultivating the entrepreneurial awareness, spirit, and ability of students in school, but also aimed at the entire society, targeting those who plan to start a business, have already started a business, and have successfully started a business. In stages and levels, education is carried out to cultivate innovative thinking and entrepreneurial ability. In recent years, more and more researchers have paid attention to the "Double Innovation" education for graduate students. Based on a survey of college students from five universities in China, the influence of entrepreneurship education on college students' entrepreneurial intention and entrepreneurial behavior has been analyzed [2]. There is an inherent correlation between innovation ability and entrepreneurial ability, so students with strong innovation capabilities, can innovative ideas be applied to complete independent entrepreneurship, ultimately to achieve excellent results in independent entrepreneurship. A wider range of students can be encouraged to boldly try entrepreneurship by constructing entrepreneurial platforms and expanding practical training bases [3]. It is imperative to explore and practice new engineering practice teaching reforms in combination with the requirements of entrepreneurship and innovation [4].

To enhance the effectiveness of the "Double Innovation" education model for graduate students in the multimedia era, it is necessary to be closely related to the times and the current situation [5]. At present, there are the following bottlenecks in "Double Creation" of graduate that urgently need to be solved: firstly, students' physiology, psychology, and even behavior have changed in the face of normalized epidemic prevention, and the original single specialized approach is no longer able to adapt to the new situation and problems faced by graduate education. Secondly, the "Double Innovation"

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education mode is not systematic, specific, and professional enough, and there are problems such as narrow educational concepts, separation of educational methods and professional education, lack of mentor team capabilities, lack of practical platforms, and lagging construction of cooperation networks and resource support systems. Based on this, it is necessary to construct a "double innovation" education model for graduate students in multimedia era with comprehensive aspects, whole processes, and multiple collaborations. As a conclusion, the demand of "Double Innovation" ability education model for graduate students in multimedia Era is analyzed in concrete to construct a comprehensive and full process education system based on the dialectical unity of Necessity and Oughtness.

II. Necessity of "Double Innovation" Education Model

A. Requirement of Comprehensive Professional Competence

Innovation is the soul of the nation, and entrepreneurship is the foundation of development [6]. The original intention of "Double Innovation" for graduate students is to cultivate students' innovative spirit, entrepreneurial awareness, and innovation and entrepreneurship ability, thereby to improve the quality of talent cultivation and further promote graduates' entrepreneurship and employment. The improvement of entrepreneurship and employment capabilities cannot be achieved without problem oriented learning and research, which cannot be achieved without the understanding of social needs required by social practice. The innovation of modern technology is motivated by multimedia technology, and the development of creative technology can accelerate the deep integration of teaching reform and modern technology. Education feeds back the development of innovative technologies, that is to say, they are integrated and promoted each other. The continuous development of the multimedia technology has brought new forms and problems, and the "double innovation" education with professional ability expansion as the core literacy can no longer meet the needs of talent core literacy cultivation in the current multimedia era.

As to the "Double Innovation" Education Mode for graduate students, there must be phased characteristics in its specific teaching content and talent cultivation tasks. It is not only an exclusive function to further focus on the cultivation of professional abilities, but also an organic integration with the core ideological and political literacy contained in the discipline and research field, such as political identity, patriotism, moral cultivation, legal awareness, and cultural literacy. Therefore, in the "Double Creation" Education Model, it is necessary to integrate political and value guidance, form an effective and reasonable mechanism, and ensure the effective development of talent cultivation in the multimedia era.

B. Requirement of Educational Perspective

The educational perspective of "Double Innovation" mode has shifted from narrow to open in multimedia era. Firstly, the online teaching mode is developing rapidly to make the sources of educational resources more abundant, teaching forms more diverse, and the content of student learning activities has also undergone certain changes. But the biggest limitation is that the interaction and supervision of different spaces between teachers and students in teaching have become difficult if the classroom teaching mode is transplanted directly on the online platforms. Secondly, with the complex trend of world value diversification and cultural globalization, people's awareness of freedom, independence, and equal competition, etc., tend to be "internalized" in the education system, and the education model of pure traditional knowledge indoctrination can no longer meet the needs of effective implementation of "Double Innovation" education for graduate students in multimedia era. Thirdly, the purpose of internationalizing graduate education is to cultivate a large number of international talents with an international perspective, understanding of international rules, and the ability to participate in international affairs and competition. The development of an international training model for graduate education in China is not only an urgent need for social development, but also a necessary way to effectively enhance the international competitiveness and influence of higher education in our country.

As a conclusion, An open perspective is the attitude that graduate students should have towards "Double Innovation" education in the current multimedia era because (1) Transformation from classroom teaching of hard knowledge to teacher-student collaborative construction of soft knowledge; (2) Integrating knowledge from various professions and fields into professional learning and research, and observing the world from a global perspective, discovering professional problems that need to be studied and proposing new measures through multidimensional comparisons of time and space.

C. Requirement of Crossing Integration of "Double Innovation" Education and Professional Education

Currently, "Double Innovation" education and professional education are generally separated from each other [7], so it is urgent to promote the deep integration of innovation and entrepreneurship education with professional education. Firstly, the integration of educational goals should be promoted to incorporate the cultivation of ideological and political guidance, innovative spirit, entrepreneurial awareness, and entrepreneurial ability into the goal system of professional education, and make it become an important criterion for evaluating professional talents. Secondly, the integration of the curriculum system. On the one hand, in addition to building basic "broad-spectrum" innovation and entrepreneurship courses, it is necessary to vigorously promote the construction of innovation and entrepreneurship courses based on the social demand and interdisciplinary. Personalized course modules and relevant course modules are provided to meet the core needs of graduate students in innovation and entrepreneurship practice, in order to achieve

personalized teaching and precise assistance. On the other hand, it is necessary to promote the upgrading and transformation of the professional curriculum system on a broader scale, so that the professional courses fully integrate innovation and entrepreneurship theory, technology, the latest achievements, and best innovation and entrepreneurship practices. Thirdly, the integration of educational and teaching methods should be further promoted. The applications of big data technology and information technology are to meet the diverse and personalized learning needs of students. practical teaching methods are improved vigorously to encourage students to apply for credits and graduate through forms such as scientific and technological innovation works, innovation experiments, and entrepreneurial projects. Fourthly, the integration of professional laboratories, entrepreneurship laboratories, and practical training centers is promoted to achieve full sharing of platform resources.

D. *Requirement of Specialized Teachers' Practical Ability*

Social-economy increasingly relies on innovation in thinking and technology in multimedia era, so how to cultivate innovative and high-quality technical and skilled talents to serve the overall development of the national economy, has been inevitably become a normalized problem that the construction of the teaching staff needs to face in multimedia era. The current challenges faced by university teachers, including a lack of practical experience in the industry, a relatively single knowledge structure, and weak guidance capabilities for innovation and entrepreneurship, urgently need to be settled. As to the social needs of the teaching staff in "double innovation" education, the professional development of teachers should be based on improving their professional theories, professional practices, and other qualities. It is necessary to pay attention to having strong political qualities, highlighting the cultivation of innovation, collaboration, and lifelong learning awareness, and behavioral practice. For the growth needs of the teacher team in "double innovation" education, improving the professional quality of the teacher team requires the joint participation of multiple main factors.

E. *Requirement of an Effective and Long-Lasting External Cooperation Platform*

At present, social participation in innovation and entrepreneurship education in universities is very limited. To promote the high-quality development of innovation and entrepreneurship education, it is urgent to break down institutional and institutional barriers [8]. Firstly, constructing collaborative education platform. Collaborate with the government, industry, enterprises, and universities to form a multi-party collaborative education platform, break through the limitations of time and space, deepen the integration of industry and education, encourage enterprises to participate in the cultivation of innovative and entrepreneurial talents in universities in all aspects such as part-time teachers, market, funds, and technological resources, and achieve collaborative education, joint innovation, and joint entrepreneurship between schools and enterprises. Secondly, constructing technology transfer and transformation platform. Universities can fully utilize their own technology transfer and transformation networks, establish channels for technology crowdfunding, fund raising, and other forms of innovation and entrepreneurship for college students through patent information services, technology transfer services, and practical base construction. Thirdly, construction of the platform for college-enterprise co-operation over a long period of time. Promote the continuous improvement of innovation and entrepreneurship education level through mentorship of innovation and entrepreneurship enterprises, joint establishment of innovation and entrepreneurship laboratories, participation in relevant organizations, and innovation and entrepreneurship competitions and activities.

III. Oughtness of "Double Innovation" Education Model

A. *Building a Comprehensive and Full Process "Double Innovation" Education System for Graduate Students*

Taking the curriculum Construction in multimedia Era as a carrier, we will coordinate the integrated construction of specialized courses, that is to say, the specialized practical elements are integrated throughout the entire process of graduate student entrepreneurship education and teaching to realize the dynamic balance between practice teaching and theory teaching. "Double Innovation" education requires students to have extremely high scientific literacy and strong innovation ability, so the integration of specialized practical knowledge with the needs of society, schools, and industries stimulates students' desire to explore innovation and entrepreneurship abilities. In the paper, the implementation of a comprehensive and full process of "Double Innovation" for graduate students has four aspects: specialized practical courses, open education modes multi-level teaching system, and a team of teachers who specialize in both internal and external training, as shown in Fig. 1.

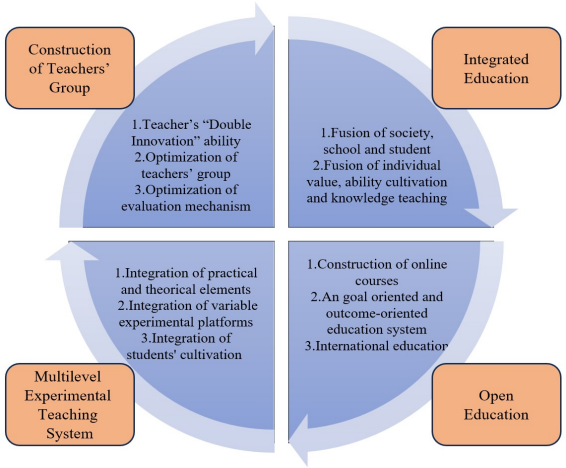

Fig. 1. A comprehensive and full process of "Double Innovation" for graduate students.

B. Building an External Cooperation Platform that All-in-One Intervention Education in and out of Class through "Diverse Collaboration"

With the effectiveness and long-term effectiveness of cultivating graduate students' entrepreneurial and entrepreneurial abilities in multimedia era, which has been discussed by the necessity of "double innovation" education model, the school's advantageous and characteristic discipline group "Artificial Intelligence and Intelligent Metallurgy" are taken as the core carrier for the construction of "Double Innovation" for graduate students, and utilized the industry background of the school, an external cooperation platform that all-in-one intervention education in and out of class. That is to say, the requirements of enterprise, scientific research institution, and local government are looked as important factors to construct the question guiding mode with universities. With the "diverse collaboration" modes, an open education model under the linkage of government, education, and enterprises, social institutions (industry enterprises) can participate in all dimensions of graduate professional group teaching in all aspects and processes, and form a multi-party sharing and collaborative education mechanism. Two-instructor system and comprehensive evaluation are applied to realize the theory-practice cooperation. the external cooperation platform for "diversified collaboration" is constructed and shown in Fig. 2.

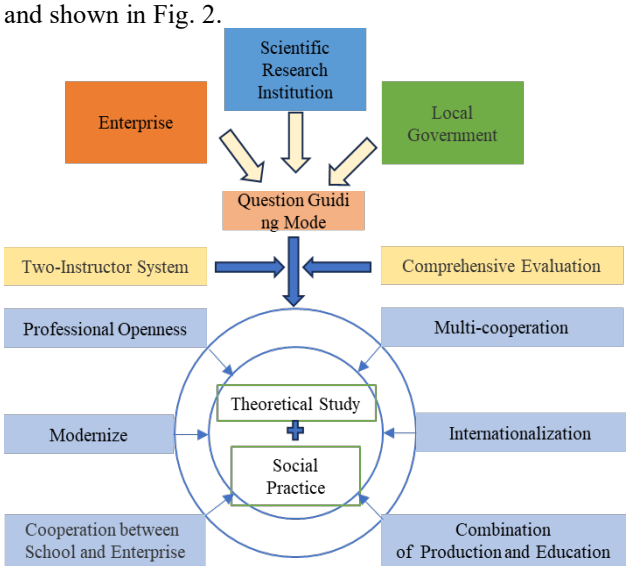

Fig. 2. External cooperation platform for "diversified collaboration".

IV. Conclusion

The education model of graduate students' "Double Innovation" abilities based on the analysis of necessity and oughtness is the foundation of this research. From the perspectives of training objectives, organizational forms, and entry points of graduate entrepreneurship education in the multi-media era, the various elements of the "Double Innovation" education environment system are designed and analyzed, which is the foundation for the construction of subsequent education models for graduate students. The social practice is integrated throughout the entire process of graduate student entrepreneurship education and teaching to achieve the full and all-round education for graduate students, and the importance of professional education is highlighted in the process, environment, and subject of graduate education. The structural design and implementation of achieving the integration of ideological and political courses, open education mode, multi-level teaching system, and the construction of an 'internal and external' teaching staff team. As a conclusion, the contributions are:

- Aimed at the current situation of cultivating graduate students' "Double Innovation" abilities in the multimedia era, the Reform of the "Double Creation" ability Training Model for Graduate Students in the multimedia era is explored with the dialectical and unified analysis of necessity and oughtness. And a reasonable and reliable goal concept and scientific system for cultivating graduate students' "Double Creation" abilities is established;
- Aimed at the construction of a teaching system for graduate students' "Double Creation" ability education in the multimedia era, a "Double Innovation" education ecological environment System is constructed with four aspects which are specialized practical courses, open education modes multi-level teaching system, and a team of teachers who specialize in both internal and external training;
- Aimed at the issues of the effectiveness and long-term effectiveness of cultivating graduate students' "Double Innovation" abilities in the multimedia era, a "diverse and collaborative" external cooperation platform with related industry enterprises, research institutions, and local governments.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Bin Liu conceived and designed the technical roadmap, implemented methods, analyzed the and wrote the paper; Weihua Huang contributed materials and analyzed the data; Zheng Jiang implemented methods; Liang Li analyzed the data; all authors had approved the final version.

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