

Functional fine-tuning of Colleges and Universities and the Cultivation of Innovative Talents Enabling the Fourth Industrial Revolution

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Abstract. In order to avoid the disconnection between talent training and social needs and enable the fourth industrial revolution, social development has put forward new requirements for university education, and points to the training of innovative talents who master high-tech knowledge and modern management ability. This paper puts forward teaching, scientific research and social service, which are three functions of colleges and universities, must be developed around whether is beneficial to the cultivation of innovative talents. Colleges and universities should make the three functions of fine-tuning. "Scientific research" and "service society" function, they will play roles under the heads of "talent training" which is the basic tasks of colleges and universities. That is: trinity focus on cultivating innovative talents. At the same time, three specific measures are put forward to set up innovative thinking and innovative methods teaching and practice courses. Trinity of talent training and scientific research and society service should provide practice and ability training. Primary and secondary schools should recognize the importance of innovation in advance, establish feelings of devotion to family and country, cultivate innovative consciousness, and form a chain of innovative talent training mode in the whole society.

Keywords: the Fourth Industrial Revolution, innovation talent training, the Trinity, Functional fine-tuning.

1. The Mission of Higher Education in the Context of the Fourth Industrial Revolution

The typical feature of the Fourth Industrial Revolution is the emergence of new technologies represented by artificial intelligence, big data, robots, etc., which are constantly changing the mode of our life, production and work. Klaus Schwab, chairman of the Davos Forum, said[1]: the Fourth Industrial Revolution is developing faster than the previous industrial revolutions. During the First Industrial Revolution, it took decades for a new technology to spread around the world, but now it will be achieved in a few years. New technologies, new products, and new applications brought about by new technologies not only change the production model, but also require changes in production management and organizational methods; and new technologies lead to changes in people's behavior and life patterns, as well as the relationship between people. If there is a difference in the relationship between them, it is necessary to make amendments to the past systems, laws and regulations, or formulate new rules. Most people mainly focus on the social progress brought about by new technologies, as well as the miraculous effects of improving production efficiency and facilitating life, in response to the Fourth Industrial Revolution. Many countries, enterprises, and many scientists and engineers engaged in research mainly consider how to improve their own and related competitiveness. However, as a big country, especially a country with more than 1.4 billion people, policy makers need to plan from a macro and long-term perspective. Such as adaptive system innovation, policy innovation, management innovation, and cultural and artistic innovation. At present, the world has entered a stage of intense international economic competition. The party and the state have always attached great importance to implementing the innovation-driven development strategy and building an innovative country. General Secretary Xi has made important instructions on many occasions, "It is required to speed up the reform of the education system, focus on cultivating students' innovative spirit, and create a large-scale,

innovative spirit, and daring to take risks." The key to mass entrepreneurship and innovation lies in motivating workers creativity, especially to stimulate the creativity of young people. In China, where higher education is being popularized, the cultivation of innovative talents for both liberal arts and science students is the mission of higher education.

2. The Significance of Cultivating Innovative Talents to Empower the Fourth Industrial Revolution

The long-term teaching practice of innovative methods has found that college students generally lack a correct understanding of the cultivation of creative ability. Opposing learning and creation, many students think that the immediate task is learning, and creation is just a distant thing; moreover, students lack self-confidence in innovation, thinking that it is the work of scientists and engineers, which is a manifestation of lack of innovation consciousness. Influenced by the traditional disciplinary system and constrained by traditional teaching models, the cultivation of innovative abilities among college students is limited. Most students tend to think and analyze problems using fixed patterns, which should be the main reason for this situation. Students rely on teachers and lack the awareness and motivation of independent innovation. At the practical level, when faced with specific problems that require specific analysis, it manifests as a lack of innovative thinking and innovative methods. When engaging in innovative activities and competitions, it manifests as poor innovative comprehensive thinking and hands-on ability. These issues reveal that the cultivation of innovative talents requires a systematic and theoretical system, and scientific methods are used to carry out training and teaching activities.

The strong objective demands of the modernization process and the inherent contradictions in the knowledge and technology system are gestating a new round of scientific and technological revolutions [3]. This scientific revolution may occur at the same time as the technological revolution. Unlike the previous three industrial revolutions, this industrial revolution is characterized by the technologicalization of science and the scientificization of technology. In order to avoid the disconnection between talent cultivation and social needs, and empower the fourth industrial revolution, social development has put forward new requirements for university education, and it is directed to the cultivation of innovative talents who master high-tech knowledge and modern management skills. The quality of cultivating innovative talents is directly related to whether China can take the lead in this industrial revolution, seize the commanding heights, and achieve the great rejuvenation of the Chinese nation.

3. Realizing Innovative Talent Cultivation Requires Fine-tuning the Educational Functions of Universities

Since the 21st century, my country's higher education has undergone some changes in the process of interacting with the modern social economy, mainly in the following aspects. University discipline evaluation, assessment, ranking, etc. Universities actively respond to these needs, making some university behaviors gradually deviate from the most original value of cultivating talents and disseminating knowledge, overemphasizing the scientific research function, making the basic mission of universities to cultivate talents weakened. When the scientific research function of universities was initially proposed, it followed the principle of "unity of research and teaching". With the development of society, university research not only serves teaching and education, but also undertakes various scientific research tasks. Some also participate in a large number of enterprise technology development and consulting projects. In this way, the link between scientific research and teaching is weakening, and the functions of scientific research are gradually on par with those of education. Some universities even surpass the functions of education[2].

The Fourth Industrial Revolution is a systematic revolution, and theoretical innovation, institutional innovation, and scientific and technological innovation demand more of the task of

cultivating innovative talents in arts and sciences, so the function of higher education must be fine-tuned. This fine-tuning can be summarized as follows: reforming the mode of cultivating talents, cultivating and creating high-quality specialists and top-notch innovators of all kinds needed for economic and social development. Scientific research should help nurture people and contribute to the discovery of knowledge and cultivation of innovative talents; universities should take the initiative to serve local and regional socio-economic development and provide knowledge and intellectual support for them, and the social service functions undertaken by universities should be more closely focused on the academic connotation of universities and aimed at cultivating innovative talents.

This fine-tuning also includes a greater emphasis on the value of "cultivating talent" as the initial function of higher education. The role of universities in serving socio-economic development through the cultivation of human resources is much broader and more profound than the role of universities in serving society through their own science and technology. The fundamental reason for universities to empower the Fourth Industrial Revolution and to be based in society is that they can provide a constant supply of new knowledge and creative talents for society. Therefore, the functions of "scientific research" and "service to society" will both play an active role under the basic mission of "cultivating human resources", and the trinity will focus on cultivating innovative human resources.

4. The Cultivation of Innovative Talents is the Focus of Fine-tuning the Functions of Higher Education

Cultivating innovative talents is the common mission of higher education in the world at the beginning of the 21st century, and it is also an important goal of higher education in China. The "Higher Education Law of the People's Republic of China" stipulates that the basic task of my country's higher education is to cultivate high-level specialized talents with innovative spirit and practical ability. At the same time, at the National Talent Work Conference, it was proposed that "the fundamental task of talent work in the new century and new stage is to implement the strategy of strengthening the country through talents", and "strive to create hundreds of millions of high-quality workers, tens of millions of specialized talents and a large number of top-notch innovative talents".

There is a close interaction between cultivating innovative talents and the fine-tuning of higher education functions. The purpose of fine-tuning higher education functions is to cultivate innovative talents, so the success of the adjustment is directly related to the quality of innovative talent training. The relationship between the two is manifested in the following two aspects.

First of all, emphasizing the cultivation of innovative talents helps to clarify the goal of functional adjustment of higher education. To cultivate innovative talents, it is necessary to clarify the basic characteristics of innovative talents, study the problems of colleges and universities in past talent cultivation, propose reform programs, and analyze the effects of reforms in school operation practice, such as injecting more knowledge outside books, experiences outside classrooms and abilities outside professions. And continuously revise the action plan.

Secondly, when it is proposed to fine-tune the functions of higher education with the goal of cultivating innovative talents, it will be very helpful to clarify the subordinate relationship between the three functions, so that the functions of "scientific research" and "social service" can be more favorable to the development or expansion of the function of "cultivating talents". The three major functions should form a joint force to ensure the achievement of the goal of cultivating innovative talents.

5. Innovative Talent Cultivation Measures

In the course of teaching innovation methods for a long time, the author found through Williams test [3] and communication that Chinese college students' creative personality and creative ability tendency are not worse than foreign college students, and they should also have advantages due to solid basic knowledge of mathematics, science and chemistry in primary and secondary school, but Chinese college students' innovation consciousness is weak, and their self-confidence in innovation is not enough, and they think that it is very far from them, and it is something that only scientists and engineers can do. The key point of the reform should be to strengthen the basic knowledge of mathematics, science and chemistry. Therefore, the key point of reform should be to strengthen students' innovative consciousness and enhance their innovative self-confidence. Creative consciousness refers to the desire, motivation and intention to create, which is the starting point and driving force of creative thinking. Successful creators always have a strong sense of innovation to discover, create and contribute, and always have a spirit of not following the rules, overcoming conservatism and negativity, and being brave and enterprising, which itself is also a manifestation of strong innovation ability. The awareness of innovation must be established through the cultivation of long-term and persistent outlook on life and values [4]. To this end, the following reform measures are proposed.

First of all, all universities should offer public teaching courses and practical courses on innovation awareness, innovative thinking, innovative methods, innovation and entrepreneurship, regardless of literature and science, with the characteristics of broad creation science. One of the typical technologies of the Fourth Industrial Revolution is artificial intelligence, and artificial intelligence relies on machines to work with massive knowledge mining, storage and deep learning, and this learning process is actually a massive identification of the knowledge in the stored and memorized knowledge base. This makes our current educational system, which is based on the transmission of knowledge, challenging. Important goals of education then need to be inclined towards the development of curiosity, imagination and creativity in students [5]. In addition to knowledge, competencies are more important. Therefore, the acquisition of innovative methods and the development of innovative abilities should be implemented first of all in the training programs. The training program is not limited to technological inventions and scientific discoveries, but is characterized as the study of innovation methods and theories in a broad sense, covering not only technological inventions and scientific discoveries but also theoretical innovations, management innovations, institutional innovations, cultural innovations, etc.

Secondly, universities can make full use of scientific research and social service function to optimize talent cultivation mode. It should update the teaching content in time, deliver the cutting-edge professional knowledge, cultivate students' practical ability and enhance innovation self-confidence. (1) Project-driven teaching can be used to improve the relevance of teaching and enhance the overall quality of students. By making full use of the resources of school-run enterprises to form teaching practice bases and internships in real office sites, students can learn and work in a real environment, combining engineering, quickly improving comprehensive problem-solving ability and enhancing innovation self-confidence. (2) Combining the first classroom with the second classroom, lead students to participate in various kinds of innovation achievements exhibitions held in China and innovation achievements exhibitions of key laboratories in universities or listen to special reports and academic reports with relevant innovation, see more, learn more and ask more questions, open up their horizons and expand their horizons. Find one or several interested directions and target objects on site, and practice communication to stimulate innovation laws. And for the product or topic of interest, use any of the innovation methods learned to improve it and carry out independent innovation, by enhancing students' innovation self-confidence and cultivating their innovation consciousness.

Furthermore, during the primary and secondary school period, we should strengthen the education of students' innovative awareness. Education is the process of continuously exerting educational influence on the educated in a specific environment. Some of the human personality

traits and qualities are formed during basic education studies, which are closely related to the level of creative tendencies and innovative consciousness, and it is difficult to change significantly during the higher education academic period. Education as a systematic project, primary and secondary education should let students know the importance of innovation, which can be carried out through six aspects of teaching: (1) How humans are separated from animal populations due to accidental innovation awareness; (2) How did the four ancient civilizations stand out from other ethnic groups due to their strong innovation ability; (3) Why is Chinese civilization the only civilization that has continued to this day due to 26 major categories of innovation; (4) How the the Four Great Inventions were introduced into the West to open the Western wisdom out of the dark Middle Ages; (5) How has the West surpassed China in terms of innovation ability in creating industrial civilization in the past two hundred years; (6) How to achieve the great rejuvenation of the Chinese nation through innovation during the fourth industrial civilization. At the same time, we learn about the family and national sentiments of scientists, such as the dedication and patriotism of the scientists who have participated in the Two Bombs and One Satellite Project, and develop an innovative personality. In the university stage, emphasis is placed on the education of innovative thinking and methods, forming a chain-type innovative education system within the education system.

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