

# Research On Organizational Model Based On The Strategic Perspective Of Global Education Science

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**Abstract.** The fourth industrial revolution has promoted the iterative updating of educational technology and the major transformation of educational research paradigm. Therefore, strengthening the basic research of educational science is becoming an important feature of global scientific and technological innovation. As a kind of interdisciplinary basic research paradigm, educational science strategy research is promoting the deep integration of educational science and broader scientific fields. This paper detailed expounds and analyses the international mainstream science fund education scientific strategy of development, main characteristics and organization mode, summarizes the major global industrial organization mode of national education science strategy of non-profit and inclusive innovation, funded interdisciplinary field for a long period of time, and increasingly improve the internal governance structure such as the common characteristic. On this basis, in view of the main defects and deficiencies of the strategic organization model of education science in China, this paper puts forward the corresponding countermeasures and suggestions.

## 1. Current situation and main characteristics of global education science strategy development

### 1.1 The number of funded projects is large and strong

In recent years, international science funds have increased investment in basic research in education science. In fiscal year 2018, the national science foundation (NSF) consists of education and human resources department (EHR) funding budget to \$761 million, accounting for 11.4% of the total amount of foundation (NSF) budget} in 2017, the German science foundation (DFG) is responsible for the financing of education and scientific research of social and behavioral science research field for 1.774 billion euros, at the same time to promote social science and natural science cooperation study of the collaborative research center for total ranked second in all projects types. In 2015, the Russian foundation for basic research (RFBR) 's total budget of state funding was close to rbs1100bn, of which the humanities and social sciences, including basic research in education sciences, accounted for 14.5 per cent, ranking third out of all eight funded fields. As of 16 July 2018, the European science commission (ERC) had funded 7,815 research projects, of which 329 were in category 4 (SH4) in the social sciences and humanities, where basic research in education sciences is located, accounting for 4.2 percent of the total funded by the European science commission (ERC).

### 1.2 The funding areas are concentrated and the direction is stable

The international mainstream science funds mainly fund basic research in educational science, especially in the intersection of pedagogy and natural or technical sciences. For example, the natural science foundation of the United States (NSF) combines traditional STEM education research with computational science and big data, encourages multidisciplinary cooperative and innovative research, and cultivates STEM labor force for the future society. The German science foundation (DFG) attaches great importance to the study of cognitive laws in the learning process and promotes the basic research of education science to apply new educational technologies to educational practice.

The Russian foundation for basic research (RFBR) emphasizes the integration of educational and engineering disciplines, emphasizing the role of education, especially engineering education, in national economic development; The European scientific commission (ERC) focuses on the role of brain science, neuroscience and psychology in education, and supports basic researchers in education sciences in areas such as neuropedagogy.

### **1.3 Flexible and diverse forms of funding**

International mainstream science funds support basic research in education science in the form of thematic project plans, special funding platforms, and project competitions. The current situation and characteristics of basic research in education science funded by international mainstream science funds show that in the fourth industrial revolution era, technological breakthroughs led to overall social changes. Strengthening basic research in education science is the fundamental need to promote educational innovation and an important push to promote the sustainable development of global knowledge and science and technology. Major industrial countries in the world are paying close attention to the deep integration of science, technology and education, and actively using national science foundations to vigorously fund basic research in education science, to develop educational science strategies based on interdisciplinary basic research paradigms and interdisciplinary frontier research results. Education science strategy is constructing the basic theory and method system of education science, natural science, technology science and other interdisciplinary, which is an important source and endogenous power to promote the transformation of pedagogy research into scientific research.

## **2. Organizational model analysis of global education science strategy**

### **2.1 Non-profit and inclusive innovation.**

Global strategy is not aimed at for-profit education science, through the education science and on the depth of education science and natural science, technological science cross fusion research widely funding, committed to the promotion of the country and the world as a whole education science and cutting-edge research, training education has the development potential of scientists and researchers, promote international education and scientific research cooperation, to enhance the overall level of education and scientific research. At the same time, the global education science strategy all focuses on the key direction of national science and technology development strategy, USES education information technology, and actively promotes the diversity and regional balance of basic research of education science, so as to realize the social inclusiveness of education innovation.

### **2.2 Long-term funding for interdisciplinary fields.**

Traditionally, pedagogy research projects belong to the pedagogy subject under the category of humanities and social sciences and are funded under the inherent category. The project funding cycle is short, usually only 3 to 4 years, and the funding form is relatively single. Driven by the global education science strategy, more and more educational science basic research projects with interdisciplinary and convergent nature adopt special funding plans or funding platforms, which can enjoy a long funding cycle of more than 5 years.

### **2.3 Increasingly improved internal governance structure.**

Mature development mode in the international mainstream science funds, on the basis of global education scientific strategy from its dial in the total funds science fund grants, follow their science fund adopts the mode of governance, follow their science fund project selection mechanism and the specific finance of whole process (although international science fund project application and approval process, but adopt the "bottom-up" project management and organizational forms to stimulate the creativity of education and scientific researchers, are all through the "peer review" the

review process to ensure the fairness of project funding), to ensure the orderly and efficient operation of the global education scientific strategy.

To sum up, the three common characteristics of the strategic organizational model of international education science reflect the general law of educational science strategy, that is, the development of educational science strategy cannot be limited to purely economic interests; The interdisciplinary nature of basic research in educational science requires a longer funding cycle; The organizational model of educational science strategy should be flexible and diverse, and should complement each other's strengths on the basis of the original science funding model.

### **3. Countermeasures and Suggestions to promote the implementation of China's education science strategy**

#### **3.1 Facing the trend of intelligent society, we should clarify the major funding direction of China's education science strategy**

Technological innovation and social change have put forward new requirements for educational scientific research. It is urgent to make clear the future strategic direction of basic research of educational science in China under the background of the fourth industrial revolution. The national natural science foundation of China, the national planning office of philosophy and social sciences, the academic department of the Chinese academy of sciences, the education committee of the Chinese academy of engineering, the science and technology commission of the ministry of education, the office of major special projects of the ministry of science and technology and other types of scientific research funding organizations should actively face an intelligent society. To proactively identify and motivate researchers to focus on the strategic direction and core funding areas of global education science from the multidisciplinary perspectives of natural sciences, technical sciences, humanities and social sciences. At the same time, combined the development status, hot issues and practical needs of China's education reform, the main funding direction of China's education science strategy is defined. Develop joint project plans and guide basic researchers in education science to apply for projects and carry out research in related fields from the bottom up.

#### **3.2 Add special codes for education science, and multi-subject cross-field funding for strategic research on education science**

Most of the basic research of education science under the strategy of education science belongs to cross-field research. It is necessary to develop the strategy of education science to provide multi-subject and cross-field special funding for such research projects. First of all, the national natural science foundation should develop actively support cross project of tradition, continue to take the lead to establish similar to F0701 (cross) on education and information science, C0913 (learning and memory) and cover from the STEM of K12 - K16 interdisciplinary integration of science, technology, engineering and mathematics) education of physical education, intelligent community oriented information system (CPS), and other education science specialized code, apply for funding for education and scientific research quality project developing channels; Secondly, break the division model of disciplines and the original funding boundaries of each science foundation, vigorously promote the multi-body cooperation between NSFC and various research funding organizations in China, and jointly set up cross-sector and cross-field joint funding codes and projects to jointly support the strategic development of education and science.

#### **3.3 Change the project-oriented funding form and strengthen the people-oriented and interdisciplinary funding**

Basic research in education science has the characteristics of long research cycle, large research investment and diversified research team composition, which can gradually change the project-oriented funding form and explore the interdisciplinary and cross-team-oriented funding mode. All kinds of research funding organizations in China should first adjust the funding period of

basic research in education science according to needs, and carry out long-term funding in a planned and phased way for major projects related to the development of basic research in education science. At the same time, we should increase the funding for basic research of education science and allocate special funds for research projects that involve key issues in basic research of education science. All kinds of scientific research fund key support object should be funded projects into funding from multidisciplinary cooperation, and sustainable development of the team of scientists, explore and promote interdisciplinary education and evaluation mechanism of interdisciplinary research, visualization to interdisciplinary teaching and research activities, to ensure the steady development of education and scientific research in China and long-term performance.

### **3.4 Optimize the organizational and governance structure of strategic research in education science and give play to the advantages of basic research in universities**

Efficient and flexible research organization governance structure is an important guarantee to improve the decision-making and operation efficiency of research funding. All kinds of research funding organization in our country should fully absorb the global education scientific strategic internal governance, external governance and hybrid governance mode, actively explore the scientific research organization pattern of "distributed governance", optimize the current main research funding organization too rigid (centralized) governance structure, moderate break subject experts in the field of research funding model, based on a research university, set up a "distributed education scientific research center" exploratory. At the same time, China's research funding organizations should strengthen strategic cooperation with international mainstream science funds and research institutions, promote China's education science strategy to keep pace with the development of global education science strategy, and improve the status of China's education science basic research in the world.

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