

Research on the Optimization of Experimental Resource Allocation in Independent Colleges for Promoting the Development of Innovation Drive in Service Areas*

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Abstract—The shortage of teaching resources in local colleges and universities is one of the main factors that affect the cultivation of students in practical skills and innovative ability. This paper makes analysis on the current situation and problems of laboratory resource allocation in local colleges and universities, and raises the methods and measures to optimize the allocation of laboratory resources, which have certain reference for local colleges and universities. It has become the powerful engine to promote the development of innovation drive in service areas of colleges and university for the implementation strategies of regional innovation drive development.

Keywords—*independent college; optimization of laboratory resources; regional innovation drive*

I. INTRODUCTION

In order to cultivate the top-notch innovative talents, many colleges and universities in China have been promoting relevant teaching reforms and research in recent years, and some of them also have proposed many methods and measures, but these works are superficial and sloganized, or only limited to a partial change in the elements of the talent development model, rather than an overall change, which is related to the deviation of people's understanding of the talent training model, the constraints of the system, and also the lack of educational resources. For the local colleges and universities of teaching and research, these methods and measures are often unrealistic that makes the implementation effect greatly reduced. Objectively, independent colleges do not have the overall educational advantages of running school and the strength of all-round development that research universities have, and their teaching resources and teaching equipment are also far behind that of research universities.

II. DILEMMA OF EXPERIMENTAL RESOURCES IN REGIONS AND IN SCHOOLS

To train the top-notch innovative talents, many colleges and universities in China have been promoting relevant teaching reforms and research in recent years, and some of them also have proposed many methods and measures, but these works are superficial and sloganized, or only limited to a partial change in the elements of the talent development model, rather than an overall change, which is related to the deviation of people's understanding of the talent training model, the constraints of the system, and also the lack of educational resources. For the local colleges and universities of teaching and research, these methods and measures are often unrealistic that makes the implementation effect greatly reduced. Objectively, independent colleges do not have the overall educational advantages of running school and the strength of all-round development that research universities have, and their teaching resources and teaching equipment are also far behind that of research universities.

A. Too Many Students Are Enrolled in Independent Colleges, but the Quality of Students Is Not High

After a continuous enrollment expansion for several years, the number of students in all independent colleges has increased dramatically from thousands of students into more than 10,000 students, and even to tens of thousands in some colleges. In this way, top-level candidates entered Peking University and Tsinghua University, high-scoring candidates entered the 985 or 211 universities, and then local colleges could only accept the candidates with low scores. In the stage of popular higher education, the admission rate for college education gets high, but the scores of students for college entrance gets low. Therefore, in the popularization of higher education, the decline in the quality of students in local colleges becomes one of the main factors that make it difficult for local colleges to cultivate top-notch innovative talents.

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B. Insufficient Attention and Investment

The state and local governments have given high attention and support to the development of higher education in China, but most of these attention and support focus on the subordinate colleges, and less on local colleges and universities. When the scale of school expands ceaselessly, the state and local governments have increased the investment in local colleges and universities year by year, but the growth rate of the investment lags far behind the expansion speed of local colleges and universities, with the investment in per capita education actually declining. As the saying goes, "it is difficult for a clever woman to do cooking without rice." UNESCO also pointed out that "the problem of funds is increasingly doing a serious hazard to the normal operation of higher education, which has led to a decline in academic standards." The serious lack of investment from the state and local governments in the education of local colleges and universities, makes their daily operation only depend on the numbered tuition fees, and they are unable to engage in the great matters about school survival and development by improving the school's infrastructure, the experimental equipment, the books and materials, the teachers' treatment and so on, which is bound to have a extremely adverse effect on the operation and development of local colleges and universities as well as the improvement of education and teaching level.

III. PROBLEMS IN THE TEACHING RESOURCES ALLOCATION IN LOCAL COLLEGES AND UNIVERSITIES

In the early stage of popular higher education, it is the only reason of teaching resource lacking in local college and universities that the enrollment expansion and education funding is not matching, and the poor management mode of the colleges and universities is also connected with the teaching resource problems. At present, many colleges and universities have many problems in the teaching resources allocation, with both resource intension and wasting coexisting.

A. Some Problems Existing in Equipment and Site Resource Allocation

Traditionally, experimental teaching has always existed based on the theory teaching. Paying more attention to theory but less to practice, and little attention to experimental teaching, arranging the laboratory based on the curriculum, small and complete, and the laboratory construction having no sufficient demonstration, with weak integrality and without long-term planning, all these are likely to cause the low use efficiency of laboratory equipment and venues in colleges and universities.

B. Management System and Operational Mechanism to Be Regulated

The management system is lagging behind, the operation is not smooth, and the departments compete for resources for balance, lacking of overall concept, carrying out separate authorities, making a repeated investment, with poor awareness of experimental resource sharing and optimization, making poor laboratory openness and a low use rate of experimental resources. With the School of Information and

Electronics of this university as an example, first the laboratories in line with the major development direction is set respectively in each department of the school, with their construction and management responsible respectively by each department, but due to the similarities among the various departments, the decentralized construction and management of each department easily cause a separate authority and repeated investment. From 2003, all the labs of the school were managed uniformly by the experimental teaching center, to avoid the repeated investment, but this also brings new problems: those laboratories for the courses with strong specialty are used in a low frequency generally, so the experimental teaching center is not provide with special personnel for its management, and it is generally locked and not open when no teaching task is arranged; thus it is more trouble for students and teachers to use the lab outside the classroom, which greatly affects the enthusiasm of teachers and students to carry out teaching activities of extracurricular practice.

C. Managers Has Low Professional Level and the Experimental Team Is Unsteady

The staffs of the laboratory management department have weak sense of responsibility and low professional level; they do not fully consider the character of each laboratory when formulating the relevant rules and regulations, to adopt a sweeping approach, so that the regulations cannot be implemented. They do not know and study the actual situation of laboratories in their management, not make an effective statistics of the laboratory data, resulting in inconsistent and closed laboratory resource information, which ultimately affects the resource utilization. For a long time, the bias for experimental teaching and laboratory work in concept and cognition makes an unpromising situation of laboratory staff team in local college, characterized by small number, low academic and professional background, low technical title, large age and outdated knowledge and overall low quality. As a result, the experimental knowledge and technology is low and not updated, and the large-scale instruments and equipment cannot be correctly used, maintained and developed, the experimental technicians become custodians who cannot meet the need for modern experimental teaching and laboratory management.

IV. METHODS AND MEASURES TO OPTIMIZE THE TEACHING RESOURCES ALLOCATION

A. To Reform the Laboratory Management System

For the problems existing in the old laboratory management mode, the school of information and electronic experiment teaching center should carry out corresponding reforms to establish a new long-term, stable and scientific mode of management. First, we must do a good job in setting up the laboratory management organization, with the dean of the school as the director of the experimental teaching center, for which many internal and external teachers with higher levels consist of a construction guidance committee of the experimental teaching center to review the overall planning and experimental room construction plan; the experimental

teaching center implements the director responsibility system, and the two-level goal management is carried respectively by the school and the college to make the laboratory management gradually scientific and standardized. Secondly, based on a good job in the construction of laboratories for the basic course and the public course, we should mainly do well the construction of "innovation laboratory of undergraduate characteristics", to provide a good scientific research and training conditions for undergraduates and promote the cultivation of undergraduates in practical skills and innovative abilities. Third, we should strengthen the management of experimental equipment, improve the equipment efficiency, make a quantitative indicator check and scientific economic benefits assessment on the procurement, use, maintenance and abandonment in the management of laboratory equipment, and further strengthen the technical and economic management, to achieve the long service life and high work efficiency of equipment.

B. To Establish a Resource Sharing Mechanism

The real implementation of resource sharing should be guaranteed by a perfect sharing mechanism. It is recommended to establish a group of each course managed by the head of the center, and a resource sharing leading organization composed of the heads of the laboratories of each department and of the laboratory branches, to realize the sharing of experimental equipment and of experimental technicians; to establish an information sharing platform based on the sharing of experimental equipment, formulate and improve the rules and regulations for the management of equipment and apparatus, improve the procurement, use, maintenance, repair and assessment of equipment, achieve standardized and scientific management, and provide the services and conveniences for the relevant management and classroom teachers to make a timely query and use of experimental equipment; to establish the measures of sharing experimental equipment according to the actual campus management of colleges and universities, and clearly define the opening of the equipment to the inside and outside of the school, and increase the use ratio of experimental equipment.

C. To Establish an Information Dialogue Mechanism with Local Government, Enterprises and Institutions

Independent colleges should make a further investigation into the government, enterprises and institutions, to comprehensively understand the local social and economic development, and the needs of the government, enterprises and institutions for talents and for science and technology, and thus develop the corresponding talent training programs in combination with the conditions of independent colleges; in the other hand, it is suggested to timely pass the information about the talent training, the information resources of laboratory and the research and development of science and technology in independent colleges to local government, enterprises and institutions. After establishing an information and communication mechanism with the government, enterprises and institutions, the independent college should conduct in-depth exchanges and discussions on the regional economic development and the construction of college discipline in a timely and regular manner, to realize the

common use of resources, information sharing, mutual growth and development, and achieve a win-win situation.

D. To Establish a Continuing Education and Talent Training Base

Local governments should support the independent colleges to develop talent training, strengthen the local people's humanities quality and their cultural education of science and technology, and build the talent exchange and training bases between enterprises and institutions. It is suggested to establish a continuing education base in colleges and universities, opening up the areas where universities are located, and providing a good learning and education platform for the further study of enterprises and institutions; to establish the internship bases in enterprises and institutions to provide a better practice platform for college students and teachers; to make use of existing laboratory resources to provide local services, conduct cadre training, hold accounting qualification examinations, and national computer grade assessment projects.

E. To Strengthen the Construction of Laboratory Teachers and Formulate a Talent Flow Mechanism

It is suggested to make use of the dominant disciplines of colleges and the demand of local enterprises, strengthen the cultivation of talents, and provide talent protection for local economic development. The above can be achieved through the two aspects; on the one hand, the engineers and technical personnel with senior titles and senior qualifications from surrounding enterprises are hired to conduct a practical teaching in the college laboratories; on the other hand, college teachers and theoretical researchers are dispatched to participate in the technology opening and actual production of neighboring enterprises. With the interactive exchanges between the two sides, it also can be done to further develop a close communication and contact with the social elites with practical experience, further promote the practical teaching of the college, and jointly work together to provide excellent human resources for the society.

V. CONCLUSION

The local colleges and universities must have their experimental resources allocated in conformity with their operation orientation and also in accordance with their strategic policy. As the support of the strategic development of schools, the optimal allocation of experimental resources in colleges and universities is a long-term and arduous task, and also complex system engineering. Local colleges and universities should make their laboratories in conformity with the new rules of operation in higher education, to first ensure the basic needs of teaching, then optimize the allocation of experimental resources, gradually realize the development of connotative construction, and take a way of connotative development in resources sharing, key construction, characteristic development and coordinated development. Independent colleges should train talents and serve the local economic development, and such a mode of both functions needs a long exploration for independent colleges, which requires independent colleges open their views, make an open

construction, ensure the need of talent cultivation, make a further integration with the localities by the mode of “introducing, and encouraging to go out”, to form a good bridge between schools and government and between schools and enterprises to make a joint construction, and fully play the role of their experimental resources in the development of regional innovation drive.

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