

Cultivating Top-Notch Innovative Undergraduates via Honor and Diversity featured International Tutoring Mechanism

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Abstract

The increasingly fierce international competition urgently requires the cultivation of more top-notch innovative talents with an international perspective. Internationalization has long led to the cultivation of top-notch innovative talents mainly targeting graduate students, with less application to undergraduate students. In response to this weak link, this article explores an internationally led concept for cultivating top-notch innovative talents, constructs a deep integration mechanism of localization and internationalization, and establishes a comprehensive system for the international cultivation of undergraduate top-notch innovative talents. Three aspects are explored: the concept of cultivating top-notch innovative talents guided by honor and diversity, the ideas and methods of deeply integrating localization and internationalization training mechanisms, and the establishment of a sound training system for undergraduate top-notch innovative talents. It proposes clear talent training paths and executable training methods, which have reference value for promoting the cultivation of international leading undergraduate top-notch innovative talents.

Keywords

International tutoring mechanism; Top-notch innovative talents; Undergraduate cultivation; Honor program; Diversified breakthrough.

1. Introduction

The current international competition is becoming increasingly fierce, and there is an urgent need to cultivate more top-notch innovative talents with an international perspective. General Secretary Xi Jinping clearly pointed out in the report of the 20th National Congress: "We must adhere to the principle that science and technology are the primary productive forces, talent is the primary resource, and innovation is the primary driving force. We must deeply implement the strategies of rejuvenating the country through science and education, strengthening the country through talent, and innovation driven development, open up new fields and tracks for development, and continuously shape new driving forces and advantages for development." The Outline of the National Medium- and Long-Term Education Reform and Development Plan (2010-2020) also clearly states: "We must carry out multi-level and wide-ranging educational exchanges and cooperation, improve the internationalization level of education in China, cultivate a large number of international talents with international vision, understanding of international rules, and ability to participate in international affairs and competition. For research universities, cultivating top-notch innovative talents is an important mission and primary responsibility, and leading the cultivation of top-notch innovative talents with internationalization is an important direction.

For a long time, internationalization has led to the cultivation of top-notch innovative talents mainly targeting graduate students, with less application to undergraduate students. The main reasons include: the large number and uneven level of undergraduate students, and the unclear

potential of their abilities; The general education and professional education system for undergraduate students is relatively complete, and objectively, a relatively complete mechanism for localized training of innovative talents has been formed; International training requires the integration of a large amount of resources, and there are problems such as high costs and insignificant results in transformation when investing in undergraduate students. The above issues have increased the difficulty of international cultivation of top innovative talents among undergraduate students, weakened the actual effectiveness of international cultivation, and constrained the development process of leading the cultivation of top innovative talents through internationalization. Therefore, it is urgently needed to optimize the concept of cultivating top-notch innovative talents, deeply integrate local and international training mechanisms, and establish a sound training system for undergraduate top-notch innovative talents on this basis.

2. Related Practices

The academician of the CAE Member Zhou Xuhong pointed out in an article published in China Higher Education in 2018 that to solve the dilemma of China's higher education, we must lead the cultivation of top-notch innovative talents with internationalization [1]. Since the reform and opening up, China's higher education has made significant progress, but there is still a serious shortage of educational resources, insufficient integration and coordination of resources, and a significant gap between innovative research results and international comparisons. The "Qian Xuesen Question" still needs to be solved urgently. Academician Zhou Xuhong proposed to transform educational concepts and establish a future oriented and global perspective on education; To promote the intersection of knowledge and disciplines, and build an integrated education and teaching system; To achieve three integrations, namely integrating into the entire process of education and teaching, integrating into the international education and training system, and integrating into interactive international communication.

In terms of exploration and practice, Jilin University was among the first to be selected into the "Top notch Program" in 2009, and set up an experimental class named Tang Aoqing Class, a former president of Jilin University, an academician of the CAS Member, and a famous chemist. As one of the five fundamental disciplines of the "Top notch Program", the School of Life Sciences at Jilin University has conducted a series of teaching research and reform practices for the international cultivation of outstanding innovative talents [2]. Through establishing overseas joint training bases, carrying out various international joint training projects, participating in international high-level academic competitions, introducing excellent foreign teachers to introduce high-quality overseas curriculum resources, and offering international cutting-edge lectures to promote the normalization of international academic exchanges, the school has constructed two international training models for outstanding innovative talents: the "long, medium, and short" trinity international joint training and the independent innovation training based on international high-level academic competitions. At the same time, it has explored and realized multiple channels for international cultivation, creating a good international training environment, Promoted the process of international education.

Nanjing University of Posts and Telecommunications Bell Talent College closely focuses on the goal of cultivating future leaders in information technology and vigorously promotes an international talent training strategy [3]. The college has established a special fund for overseas study visits to ensure and support students' participation in overseas study visit programs. Two short-term study visit programs and one long-term study visit program are implemented annually. The content of the short-term visiting study program mainly includes foreign language learning, cultural exchange, professional knowledge learning, and cultivation of innovative thinking ability; Long term overseas study abroad programs lasting more than 3

months mainly focus on professional course learning, with students organizing extracurricular activities such as visits and exchanges. In response to the differences in classroom course hours and teaching content between domestic and foreign universities in the visiting study program, which result in students being unable to transfer credits in a timely manner and delaying grade recognition after returning to their home country, the college actively explores the educational management of overseas visiting studies in promoting the international cultivation of top-notch innovative talents in the field of electronic information, and has achieved good results in management.

The Qian Weichang College of Shanghai University is one of the first batch of "National Pilot Colleges" by the Ministry of Education. Based on the development strategies of the country and Shanghai, Qian Weichang College has carried out a series of educational and teaching reform experiments, implementing the innovative talent cultivation strategy of "emphasizing foundation, interdisciplinary, and internationalization" [4]. Since 2014, the college has hired several international renowned teachers to carry out course teaching, such as Walter Gander, a professor of numerical analysis and scientific computing at the Swiss Soviet State Institute of Technology and a renowned scholar in the field of computer science and engineering education (CSE), to teach the course "Mathematical Experiments". The college has also established a platform for students to study and exchange overseas, and launched international exchange programs such as "College Talents - Hong Kong Station" and "College Talents - UK Station" during the summer semester. By visiting prestigious schools and conducting social and exchange activities with local students; Through enterprise inspections, attending lectures by senior industry professionals, discussing career development and life planning with students, enabling them to understand social development and policies, and enhancing their leadership and competitiveness towards the future society.

3. Honor and Diversity featured International Tutoring Mechanism

To solve the above problems, this project proposes the concept of honor and diversity featured top-notch innovative talent cultivation mechanism, deeply integrating localization and internationalization trainings. Based on that, a sound undergraduate top-notch innovative talent cultivation system is established, expounded as follows:

(1) The concept of cultivating top-notch innovative talents guided by honor and diversity featured international tutoring mechanism

Research on the cultivation mode of honorary bachelor's degree, analyze the positive effects of this system on students forming relatively independent learning groups, enhancing learning motivation and elite consciousness, collective sense of honor and mission, and pay special attention to the dynamic mechanism of application withdrawal of honorary bachelor's degree. Study effective methods for quantifying and transforming undergraduate achievements from multiple channels such as academic achievements, subject competitions, and entrepreneurial applications, and explore the flexibility and effectiveness of the application withdrawal mechanism. Research on the integrated ideas and practices of the top-notch innovative talent cultivation concept of "honor led, diversified breakthroughs" in the process of undergraduate general education and professional education, and its positive role in leading the growth of undergraduate students.

Developed countries in education have made many beneficial attempts and achieved successful experiences in cultivating top-notch innovative talents. Implementing various "honor programs" and awarding "honorary bachelor's degrees" in universities is one of the most effective and popular methods for universities to cultivate excellent undergraduate talents. This project proposes a dynamic and flexible "honorary bachelor's degree" system, whose basic goal is consistent with current practices, which is to encourage exceptionally outstanding

students to stand out, provide them with more and richer educational resources and research conditions, such as honors courses, research projects, etc., and cultivate them into the most innovative and academically promising peers among their peers. At the same time, a dynamic application exit system can avoid the fixed labels that may lead to some students developing an inappropriate sense of superiority or even unhealthy psychology. The enhancement of openness can better lead and demonstrate among undergraduate students.

(2) Ideas and methods for deeply integrating localization and internationalization training mechanisms

On the basis of a relatively complete localization training mechanism, explore the integration methods of international training elements to achieve a deep integration of localization and internationalization training mechanisms. Sort out the international training elements to be introduced, systematically integrate teaching resources, scientific research resources, practical resources, foreign affairs resources, and cultural resources, study the integration nodes, forms, and degrees of each element resource, and quantify the evaluation indicators of the integration of each element resource into education effectiveness. On this basis, analyze the role of international training elements in expanding and enhancing the current localization training mechanism, and analyze the positive role of deeply integrated localization and internationalization training mechanisms in promoting the cultivation of outstanding innovative talents among undergraduate students.

The deep integration of localization and internationalization training mechanisms proposed in this project can be seen as a rejection of the concept of "local internationalization" in higher education proposed by Swedish educator Bengt Nilsson. The core content of "local internationalization" is to aim for students to have cross-cultural communication skills and international competitiveness, with the background of highly developed economic globalization and information technology, based on their own country and school, to form an international talent training system, so that all students can receive international education and become international talents. That is to say, the vast majority of students must complete their international training process on domestic campuses. Based on the above understanding, this project proposes a deep integration of localization and internationalization training mechanisms, which is a distinctive way of cultivating international talents. This integration fully respects national conditions, school conditions, and educational laws. Starting from reality, based on the localization training mechanism, it designs international teaching resources, scientific research resources, practical resources, foreign affairs resources, cultural resources, etc. as a powerful expansion and improvement of the localization training mechanism, and explores a path for cultivating international talents with Chinese characteristics. It is expected to provide experience and examples for the cultivation of international talents in similar universities.

(3) Establish and improve the training system for outstanding innovative talents among undergraduate students

Systematically organize undergraduate education elements such as teaching courses, research laboratories, competition and entrepreneurship practices, exchange programs, and cultural and sports activities, and establish a training system for outstanding innovative talents among undergraduate students. Pay special attention to the condensation and introduction of advantageous teaching resources, and study the outstanding role of hiring international teaching masters and research mentors in cultivating top-notch innovative talents. Improve the refinement and implementation of various international training elements and resources, sort out and form a clear international training system for outstanding undergraduate innovative talents, and implement the specific results of internationalization leading the cultivation of outstanding undergraduate innovative talents.

We plan to focus on establishing a sound undergraduate top-notch innovative talent training system from five aspects: teaching courses, research laboratories, competition and entrepreneurship practices, exchange programs, and cultural and sports activities. Firstly, the construction of an international curriculum system, with relevant professional teaching content aligned with international standards, guided by high-quality courses and bilingual course clusters, plays a leading role in improving the overall level of curriculum construction. Secondly, based on the integration of research mentors and laboratory resources, establish an undergraduate research training program, and regard research training as an important means to improve the quality of undergraduate teaching and cultivate high-quality talents. Thirdly, relying on the existing subject competition system and innovation and entrepreneurship training programs, further subdividing subject competitions and entrepreneurship application tracks, teaching students according to their aptitude, and cultivating different types of top-notch innovative talents. Fourthly, at the school level, we will strengthen the construction and investment of diversified student exchange programs with globally renowned universities. In combination with the application mechanism for honorary bachelor's degrees, we will appropriately expand the proportion of undergraduate funding, encourage and increase the number of students sent abroad for short-term study and further education, and return to China to obtain degrees. Fifth, strengthen cross-cultural communication through a series of cultural and sports activities, increase efforts to develop education for international students studying in China, organize cross-cultural exchange activities such as salons and forums, and expand the international perspective of undergraduate students.

4. Discussion

It is valuable and urgent to shift the focus of internationalized cultivation to undergraduate students. To overcome the practical difficulties, it is indispensable to innovate the international cultivation mechanism of top innovative talents among undergraduate students. The significance of the proposed honor and diversity featured international tutoring mechanism includes:

- (1) The top-notch innovative talent cultivation concept of "honor led, diversified breakthroughs" runs through the general education and professional education process of undergraduate students. Through the application withdrawal system of the honor bachelor's degree, it dynamically leads the growth direction of the undergraduate group. Through multiple channels such as academic achievements, subject competitions, and entrepreneurial applications, it consolidates the accumulation and transformation of undergraduate students' achievements, solves the problem of unclear ability potential of undergraduate students, the need for training and selection, and the insignificant effect of achievement transformation;
- (2) The proposed mechanism deeply integrates localization and internationalization training mechanisms, incorporates internationalization training elements as an important expansion and powerful improvement of localization training, and promotes the cultivation of top-notch innovative talents for undergraduate students. On the basis of the existing localized training mechanism, integrate teaching resources, scientific research resources, practical resources, foreign affairs resources, and cultural resources, purposefully expand and improve the shortcomings of the current training mechanism, and solve the problems of relatively complete localized training mechanism, insufficient motivation for undergraduate internationalization training, and high cost;
- (3) Taking teaching courses, research laboratories, competition and entrepreneurship practices, exchange programs, cultural and sports activities as the starting point, we will establish and improve the training system for outstanding undergraduate innovative talents,

perfect and refine the integration of various resources, and implement the specific results of internationalization leading the cultivation of outstanding undergraduate innovative talents.

5. Summary

This article proposes a top-notch innovative undergraduate international training mechanism characterized by honor and diversity. Through the exploration of the concept, mechanism, and system construction of international training for outstanding undergraduate innovative talents, the problem of the lack of international elements in the process of cultivating outstanding undergraduate innovative talents is solved, and internationalization is promoted to lead the cultivation of outstanding undergraduate innovative talents. The paper elaborates on three aspects: the concept of cultivating top-notch innovative talents guided by honor and diversified breakthroughs, the ideas and methods of deeply integrating localization and internationalization training mechanisms, and the establishment of a sound training system for undergraduate top-notch innovative talents. The proposed talent training path and methods have clear and executable characteristics, which helps promote the cultivation of international leading undergraduate top-notch innovative talents.

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