Research on the Educational Mechanism for Cooperative Training of Innovative and Entrepreneurial Talents in University

Xuegang Chen, Sheng Duan*, Dongmin Mo, Luda Wang, Qian Wu and Meiling Zhang
College of software and communication engineering, XiangNan University, Chenzhou, 423000, China
*Corresponding Author: Sheng Duan

Abstract: From the perspective of the cooperative education mechanism between university and enterprise, and studies the theory of education, the mechanism of university education and the relationship of the talent training mode-the mechanism of education, takes the cooperative training cases of three universities of china as the data source, puts forward a talent training mechanism of cooperative innovation and entrepreneurship. This mechanism clarifies the educational goal, improves the curriculum-teaching method, increases the feedback mechanism of enterprise-university, redefines the evaluation method of education, ensures good communication of university-enterprise-student, and then guarantees the normal operation of the cooperative education mechanism. The mechanism is market demand-oriented, to cultivate talents adapted to social development, to solve the problem of disconnection between theory and practice, students lack of practice, and to provide a strong theoretical basis for promoting the training of national innovative entrepreneurs.

1. Introduction
Collaborative talent-education mechanism of university-enterprise is one of the main mechanisms for educating people at present; Xiao Y [1] made a deep analysis of the university-enterprise cooperation model from the perspective of industry-university's research, summarized the model from different angles, and provided a powerful reference for university-enterprise cooperation. Dong J[2] studied the mechanism of collaborative talent education from the perspective of talent incentive, and he believed that the methods of enterprise incentive should be applied to universities, it can not only provide more resources for universities, but also promote the further improvement of the level of talent training. Bifen C [3] defined cooperative education, they believed that cooperative education is aimed at students and established the implementation method of theoretical learning-skill training-practical operation to help students acquire all-round development and master the process of requiring skills with the implementation method. Lina W [4]'s research on university-enterprise cooperation added some elements of government support, he believed that university-enterprise cooperation cannot be separated from government support. In the issue of universities training talents, Sun D L [5] further emphasized that universities need not only to train talents, but also to promote talents to obtain more innovative results, therefore, it is necessary to strengthen industry-university cooperation. Yongqian F [6] analyzed the shortcomings of current industry-university cooperation model, it is showed out that the current mode of cooperation attaches too much importance to the output of results and neglects the development of universities, universities and enterprises should establish equal cooperative relations.

From the perspective of the cooperative education mechanism between university and enterprise, this paper studies the theory of education, the mechanism of university education and the relationship
of the talent training mode—the mechanism of education, takes the cooperative training cases of three universities of China as the data source, puts forward a talent training mechanism of cooperative innovation and entrepreneurship. This mechanism clarifies the educational goal, improves the curriculum-teaching method, increases the feedback mechanism of enterprise-university, redefines the evaluation method of education, ensures good communication of university-enterprise-student, and then guarantees the normal operation of the cooperative education mechanism.

2. The Theoretical Basis of Collaborative Education in Universities

In order to study the feasible mechanism of university education, we need to make a theoretical analysis of the concepts involved in the mechanism of education.

2.1 General Mechanisms of Education

Mechanisms[7] are generally used to express the construction and realization principles of machines, in the field of biology and molecular science, mechanisms represent the working principles of various parts of life, represent the activity processes of different components, put the word into the term of sociology, it can be understood as the sum of institution, mechanism, internal correlation of mechanism-institution, that is, the internal composition and development laws of structures, from the perspective of education, education mechanisms[8] represent feasible ways for universities to explore the method of educating people, explore the law of student learning and the law of growth, on this basis, universities can introduce a system of competition and incentive, promote students to play their subjective initiative, fully show their potential, help them grasp the skills needed by society, and contribute their strength to society. From the perspective of the operation method of education mechanism, experts believe that two points need to be grasped[9], namely: (1) to clarify the interaction among universities, students and other elements, so as to understand how to coordinate and play the role of various entities. (2) To adopt a specific implementation method, call each element, so that it can work in a mode of operation and establish a closer cooperative relationship with each other, make the whole model work.

2.2 Cooperative Education

"Cooperative education"[10] is derived from cooperative education, it means that education needs many forces, not just the strength of universities, the development of universities is accelerating, the volume is expanding, the demand for teachers and materials is increasing, and universities are constantly adapting to the changes of the external environment and reforming their internal structure. In the 1990s, experts of academia put the concept of "joint training"[11] into defining collaborative education, that is, to obtain educational resources from different regions and fields for comprehensive training of students. Universities can train students overseas by way of going abroad and visiting universities, they can also establish cooperative relations with enterprises, with the help of technology and market experience of enterprises, and they can help students apply theory to concrete practice.

At present, universities adopt collaborative education mode[12] to train graduate students, provide graduate students with various research projects, so as to master more funds, enterprises and technologies, students can master the implementation process of a project, not only technology, but also the internship experience of enterprises, and participate in the project plan of enterprises. From the perspective of the leading mode of collaborative education, it involves universities, enterprises and the government, and we can adopt the leading mode of universities, the leading mode of enterprises, the leading mode of government, the mode of university-enterprise alliance, and multi powers' mode of government-led-enterprise/university participation and so on. Collaborative education mode can promote students to use knowledge and do practical work under certain conditions of social practice and market operation, and then help universities improve their teaching quality.

3. Case Analysis of Collaborative Training-Education of Universities

We study the cooperative education mechanism, draw lessons from the current successful cases, analyze these cases, here we select Dalian university of technology, life science College of south china agricultural university, Shandong Jiaotong College and Qiqihar College of engineering as examples,
these universities all have strong teaching strength, and adopt the cooperative education mechanism, and we study their collaborative methods of educating people separately.

3.1 Case Study of Cooperative Education in Dalian University of Technology

As a member of the first batch of key universities in new china, Dalian university of technology has strong scientific research strength, in the early stage of reform and opening-up, it implement the education mode of cooperative education mechanism, during the development of cooperative education mechanism, Dalian university of technology has successively experienced project cooperation of the enterprise level, cooperation platform of the committee level, enterprise-national technology center and professional research institute on cooperative education, the mechanism of Dalian polytechnic's collaborative education is as follows:

![Cooperative Education Mechanism](image)

**Figure 1.** Cooperative education mechanism of Dalian university of technology

As can be seen from Figure 1, the cooperative education mechanism of Dalian university of technology includes the teaching mode of "3+1", the creation of innovative experimental classes and the school-enterprise joint research institute, in the "3+1" teaching mode, Dalian university of technology establishes engineering practice centers with different enterprises, it aims at training outstanding engineers, formulates plans, which are jointly formulated by universities and enterprises, students carry out engineering practice under the management of industry, familiarize product's development process and enhance their engineering practice ability. Dalian university of technology and other companies have established enterprise-level Colleges of nuclear power specialty, enterprises can not only guide students' engineering practice, but also help students complete graduation design and guide students' thesis writing.

In order to cultivate students' innovative ability, Dalian university of technology selects some excellent students and arranges them into the innovative experimental class. The innovative experimental class covers all kinds of teaching instruments, which include projectors, computers, chemical/physical instruments needed by students in class, electronic questioners, etc. Students can enhance their hands-on ability in class, clarify what they have learned from the experiment, establish self-confidence in experimental operation, and dare to challenge the difficult problems of scientific research.

In terms of professional characteristics, Dalian university of technology and enterprises have established respectively blower research institute and oil exploration research institute, among them, blower research institute is the result of cooperation between enterprises and Dalian university of
technology, the institute draws some experts and scholars from schools and enterprises, form the research team of the institute, the start-up fund of the institute exceeds 6 million¥, and the experiment of large-scale high-speed compressor rotor and the experiment of bearing noise reduction have been completed, at the same time, there are many projects in the process of declaration. Petroleum exploration research institute is a professional research institute established by Dalian university of technology and enterprise for improving the technological capability, the researchers of the Institute include the research team engaged in carbon dioxide recovery, the research team of high purity other preparation, and the research team of air pollution control.

3.2 Case Study of Cooperative Education in College Of Life Science of South China Agricultural University

South china agricultural university has obvious professional characteristics and it is the key university constructed by the ministry of agriculture, it has strong professional strength in the field of crop growth and animal growth, the College of life science has introduced the current cutting-edge life science technology, train innovative agricultural professionals for enterprises, in the course of its development, the College has gradually formed its own unique cooperative education mechanism.

As the primary industry, the development of agriculture determines the price of food and food of the Chinese people, pork, vegetables and drinks on the Chinese table are inseparable from agriculture, china has a population of 1.3 billion, the huge population needs developed agriculture to solve the food problem of the people, the pressure of resources and the huge population form the contradiction of agriculture, therefore, agriculture needs to cultivate more innovative talents to help china solve the problem of agricultural output-population.

In the mechanism of collaborative education, south china agricultural university has adopted such methods as double tutor training, order-based talent training, and the establishment of joint enterprise-university research base, as follows:

As can be seen from Figure 2, the cooperative education mechanism of south china agricultural university adopts the double tutor system, the order-based talent training model and the joint establishment of research bases by enterprises and universities.

Among them, the double tutor system is that the school equips the students with in-school tutors and out-of-school tutors, the in-school tutors are mainly responsible for the students' study, life and graduation design guidance, the out-of-school tutors are the tutors dispatched by enterprises, which have long-term cooperation with the College, these tutors pay more attention to scientific research and
practice, and can provide students with professional learning and social opportunities.

Under the mode of order-based talent training, 25 students are selected, put them into the special tutoring class, the College will employ special staff to tutor these students and set up class scholarships to encourage students to study actively, every year, it needs to complete the training tasks of "classroom learning-enterprise practice-secondary learning-enterprise testing", then increase students' ability to apply knowledge and this mode is highly professional.

South China Agricultural University and enterprises set up joint research base, under this model, enterprises/Colleges implement joint-stock cooperative system, with 85% of enterprises and 15% of Colleges, Colleges can participate in major decision-making of bases and send professional teachers to enterprises for technical advisory and other positions. Enterprises provide specialized experimental sites for Colleges and provide equipment needed for experiments, which include animal-plant incubation, the laboratories of animal-plant breeding, feed testing units and so on.

4. Educational Mechanisms of Collaborative Innovation-Entrepreneurial Talent

Combining with the above cases, we propose a training mechanism for collaborative innovation-entrepreneurship talents, and we need to clarify the training objectives, put forward feasible implementation methods, change the concept of students' practice in enterprises, establish an effective College-enterprise collaboration mechanism, and evaluate the effect of education.

| Section         | Description                                           |
|-----------------|-------------------------------------------------------|
| Training Purpose| 1. Serve local economic development.                  |
|                 | 2. Students can be as service center.                 |
|                 | 3. Cultivating ability can be as service standard.    |
|                 | 1. Resource expansion.                                |
| Training Orientation | 2. Base construction.                              |
|                 | 3. Promote students' employment.                      |
|                 | 1. Cultivate innovative ability.                      |
| Training Objective | 2. Adapt to the society and the needs of enterprises.|
|                 | 3. Develop students' comprehensive ability.          |

From the perspective of teaching, in order for students to have strong theoretical knowledge, we need to take engineering basic courses, professional knowledge and professional auxiliary knowledge as the necessary courses for students, and set up corresponding credits. The knowledge involved in a field is not limited to a certain subject or a certain specialty, it needs to be interdisciplinary, it needs to give students enough knowledge to promote students to innovate their knowledge, for example, engineering students should minor in liberal arts to improve their humanistic quality. At the same time, theoretical knowledge needs to be closely linked to the needs of enterprises, what enterprises need, theoretical courses should be adjusted accordingly, for example, for Japanese enterprises, it needs to increase Japanese learning, for software enterprises, it needs to learn java programming, learn embedded operating system and so on.

From the perspective of joint training, enterprises and Colleges can sign employment contracts, which can improve the efficiency of orders, that is, according to the needs of enterprises, adjust the settings of class, that is, enterprises need more, increase the setting of professional classes. enterprises need smaller, reduce the number of professional classes to one. College-enterprise should share their own resources, enterprises provide practice platform for Colleges, and Colleges become the base of enterprise research-talent training, so as to achieve mutual benefit. From the technical level and cost level, Colleges and enterprises should strengthen communication, Colleges can learn the technology of enterprises without touching the intellectual property rights of enterprises, Colleges need to provide
corresponding guarantee for the internship opportunities provided by enterprises, which include student management and necessary expenditure. The specific implementation method is shown in Fig. 3.

**Figure 3. Implementing measures for education-training**

Colleges and enterprises need to establish an effective coordination mechanism, in order to promote the training of talents, a reasonable education mechanism needs the coordination of both sides, Colleges need to complete their own teaching tasks, enterprises need to take enterprise efficiency as the primary task and employ talents to meet market demand, in this background, Colleges should increase the demand for students, that is, on the basis of previous teaching objectives, adjust the existing curriculums, which are based on the needs of enterprises, at the same time, on the scale of talent evaluation, not only be assessed by Colleges, but also enterprises participate in, that is, whether students meet the enterprise talent standards, it needs to be assessed jointly by enterprises and Colleges.

The collaboration mechanism of enterprises-Colleges needs to be based on the common concept, and most of the lectures in Colleges are completed in the classroom, while enterprises think that social practice is more important than classroom learning. Colleges think that the definition of talents is to complete the tasks assigned by Colleges, and enterprises think that talents need to create more benefits for enterprises. From another point of view, many enterprises need to bear their own business risks, and most schools are financed by society and supervised by the government, therefore, enterprises recruit employees, hope that they can have strong adaptability, practical ability, meet the needs of the market, help enterprises to tackle key problems and develop new products, Colleges should change their concepts and integrate current classroom learning into the change of market. College culture emphasizes that students should obey classroom content and emphasize knowledge memory, in enterprises, market changes are much faster than the pace of enterprise development, therefore, enterprises hope that talents can discover market changes in time and put forward corresponding suggestions for enterprise development, sum up, effective coordination mechanism is shown in Fig.4.
Under the mechanism of collaborative education, enterprises and Colleges participate in the evaluation of talents, in learning and practice, and students should not only meet the curriculum requirements of Colleges, but also meet the market demand of enterprises for talents, the training standards of talents are as shown in Table 2.

| Table 2. Evaluation Criteria for Talents |
|------------------------------------------|
| **Section**                             | **Description**                                      |
| Knowledge                                | 1. Theoretical knowledge.                            |
|                                          | 2. Professional knowledge.                           |
|                                          | 3. Minor knowledge.                                  |
|                                          | 1. Analytical ability.                               |
| Skills                                   | 2. Ability to detect market changes in a timely manner.|
|                                          | 3. Strong practical ability.                         |
|                                          | 1. Basic qualities.                                  |
| Qualities                                | 2. Professional qualities.                          |
|                                          | 3. Understanding of corporate culture                 |

5. Conclusion

From the perspective of the cooperative education mechanism between university and enterprise, this paper studies the theory of education, the mechanism of university education and the relationship of the talent training mode—the mechanism of education, takes the cooperative training cases of three universities of China as the data source, puts forward a talent training mechanism of cooperative innovation and entrepreneurship.

From the overall design of education and training, we enumerate the training objectives, training orientation and training objectives. From the perspective of implementation methods, from the perspective of classroom teaching and practical teaching, we increase courses according to enterprises, achieve order-based training, make use of the advantages of both sides, and achieve complementary advantages. From the perspective of coordination mechanism, we advocate changing the inherent concept of enterprise-College existence and establishing common values, which help Colleges to set courses in line with the requirements of enterprises and improve students' employment.
On the issue of talent evaluation, we advocate that enterprises and Colleges jointly evaluate students' comprehensive quality, which includes students' knowledge, students' ability and students' quality.

6. Acknowledgement
The authors would like to thank for financial support by youth fund project of the humanities and social sciences of Education Ministry (15YJC870004), science and technology innovation team of XiangNan University, Hunan province undergraduate research-based learning and innovative experimental project (719), social science planning project of Chenzhou(Czszkl2017067) and Institute of big data science of XiangNan university.

7. Reference
[1] Xiao Y. International Trade Professional Curriculum System Innovation and Personnel Training Model Exploration [J]. Physics Procedia, 2012, 33:1420-1425.
[2] Dong J. CDIO Based Optimization of Urban Planning Personnel Training Courses in Forestry Universities [J]. Asian Agricultural Research, 2014(9):81-84.
[3] Bifen C, Zongyi W U, Wenchang Z, et al. The Research and Practice of Professional Training for Rural Regional Development Under the Guide of Agricultural University Students' Innovative Undertaking [J]. Journal of Yunnan Agricultural University, 2015, 329(5):317-323(7).
[4] Lina W. Professional Personnel Training Mode Innovation of Business Administration Based on the Employability Skills[C]// International Conference on E-business & E-government. IEEE Computer Society, 2012.
[5] Sun D L, He H, Lo J X, et al. Research on Information Technology Innovation and Three-Dimensional Entrepreneurship Diversified Personnel Training Practice Teaching System[J]. Applied Mechanics and Materials, 2014, 519-520.
[6] Yongqian F, Xin J, Shaonan Z . Entrepreneurship Personnel Training Ways of Animal Husbandry and Veterinary Profession [J]. Heilongjiang Agricultural Sciences, 2013.
[7] Raelin J A, Bailey M B, Hamann J, et al. The Gendered Effect of Cooperative Education, Contextual Support, and Self-Efficacy on Undergraduate Retention [J]. Journal of Engineering Education, 2014, 103(4):599-624.
[8] Dellaportas S, Cooper B J, Leung P. Measuring moral judgement and the implications of cooperative education and rule-based learning[J]. Accounting & Finance, 2014, 46(1):53-70.
[9] Drysdale M T B, Mcbeath M. Exploring hope, self-efficacy, procrastination, and study skills between cooperative and non-cooperative education students [J]. Asia-Pacific Journal of Cooperative Education, 2014, 15(1):69-79.
[10] Waryszak R Z. Student perceptions of the cooperative education work environment in service industries [J]. Progress in Tourism & Hospitality Research, 2015, 3(3):249-256.
[11] KA Reinhard. Comparative Cooperative Education: Evaluating Thai Models on Work-Integrated Learning, Using the German Duale Hochschule Baden-Wuerttemberg Model as a Benchmark.[J]. Asia-Pacific Journal of Cooperative Education, 2016, 17.
[12] Ramirez N, Main J B, Ohland M W. Academic Outcomes of Cooperative Education Participation[C]// Frontiers in Education Conference. IEEE, 2015.