

# Management Mechanism for Industry-Academia Cooperation in Higher Education

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**Abstract:** The practical orientation of industry-academia cooperation in higher education provides a niche space for vocational colleges, forming a differentiated field from general universities. Based on a literature review, this article explores the management mechanism for industry-academia cooperation in higher education from three levels: planning, execution, and evaluation. The implementation of the teaching system for industry-academia cooperation education allows students to learn by doing and do by learning through the interactive rotation of "school learning" and "workplace learning" courses. This process combines theory, practice, and reflection, achieving a close interactive relationship between theoretical instruction and workplace internship verification, and ultimately achieving the educational goal of "practicality," which is highly valued in higher education.

## 1. Introduction

In the past few decades, higher education has experienced unprecedented changes. In order to achieve equal educational opportunities and meet the needs of the general public, higher education has moved from an elite-focused model to a mass education model. However, the massive increase in education funding has increased the burden on universities. In order to alleviate the financial burden and increase the proportion of self-raised funds for higher education institutions, various regulations on higher education institutions have gradually been relaxed and market mechanisms have been introduced, forcing higher education institutions to actively respond to market demands. The market-oriented nature of higher education that followed its massification has led to the emergence of entrepreneurial universities[1]. In the trend of market-oriented higher education, cooperation between industry and academia has become a key issue for entrepreneurial universities.

In the face of the impact of globalization in the 21st century and the rapid changes in society, technology, and the economy, the global competitiveness of industries depends on the skills and abilities of their employees - the ability to think systematically, experiment, collaborate and apply knowledge. Therefore, companies are more concerned with experience-based programs in universities that can enhance the technical skills of their employees, in order to meet the needs of employee recruitment and selection. In light of this, higher education institutions and industries should develop educational partnerships and multidimensional strategic alliances to fulfill the three functions of teaching, research, and service and achieve the mission and tasks of the university.

Cooperative education, also known as co-op, is an educational approach that combines the efforts of both industry and academia to achieve common education goals. In the past, it has been criticized for bringing work experience into academic courses, and traditional views have regarded cooperative education as an effective training strategy rather than an educational strategy[1-2]. However, in recent years, it has gradually become the mainstream trend of higher education in Europe, Asia, and America, and has shed its marginalized status[3]. This study takes cooperative education as its main focus, and explores the development of industry-academia cooperation in higher education institutions, investigating the management mechanism for industry-academia cooperation in higher education.

## **2. Literature Review**

### **2.1. Cooperative Education (co-op)**

Cooperative education between industry and academia refers to the integration of classroom learning with practical work experience, allowing students to apply their academic knowledge to real-world situations through relevant job experiences with employers. They then bring the challenges and insights gained from work back to school for further analysis and reflection.

### **2.2. Management Mechanism**

Mechanism refers to the processes and ways in which different parts of a work system or organization interact with each other. Management mechanism is a systematic organization and practice that involves planning, execution, supervision, performance measurement and evaluation, feedback, and other activities. By integrating and coordinating the participation of all component parts, it can execute strategies correctly and achieve individual and collective goals [3-4]. As the cooperative education between industry and academia explored in this study involves collaborative relationships among different organizations, its management implications require more coordination and integration functions than simple internal organizational management concepts. Therefore, "management mechanism" is used to explain the complex collaboration relationships and behaviors between organizations.

### **2.3. Types of Industry-Academia Cooperative Education**

#### **2.3.1. Rotational Industry-Academia Cooperative Education**

Rotational Industry-Academia Cooperative Education is mainly achieved through cooperation between schools and employers to plan and implement theoretical teaching and skill training alternately in schools and enterprises. Typically, after students enroll, they receive basic education at school for a period of time, and then are divided into two groups. One group receives additional vocational theory learning at school while the other group receives vocational skill training at work sites[5]. Every so often, the two groups rotate, completing the established program of theoretical teaching and skill training to acquire vocational competency.

#### **2.3.2. Staggered Industry-Academia Cooperative Education**

Staggered Industry-Academia Cooperative Education regards education as an accumulative function, which divides educational curriculum into three parts: basic education, professional education, and workplace education. After enrolling, students receive extensive basic education first, followed by specialized education, and in the last year, they go to enterprise institutions to receive professional education in actual work situations. Therefore, their work experience occurs in the later stage of vocational education curriculum.

#### **2.3.3. Internship-based Industry-Academia Cooperative Education**

Internship-based Industry-Academia Cooperative Education arranges for students to work at cooperative institutions during winter and summer breaks or a portion of the school's teaching time. The main purpose is to let students experience the real working world to compensate for the shortcomings of school education[1]. Usually, cooperative institutions do not pay salaries or pay lower wages than regular employees. The external internship system implemented by medical schools, teacher colleges, and nursing schools in various countries is a type of Industry-Academia Cooperative Education of this kind.

#### **2.3.4. Research-based Industry-Academia Cooperative Education**

Research-based Industry-Academia Cooperative Education often occurs at the research institute stage of higher education. Enterprise institutions entrust universities with research and development needs, and professors accept and guide graduate students in research. The enterprise provides the necessary funds and equipment.

### **3. Analysis of Management mechanisms of Industry-Academia Cooperative Education**

#### **3.1. Relationships between workplace learning and school learning**

Industry-Academia Cooperative Education is defined by both workplace learning and school learning. The success of Industry-Academia Cooperative Education depends on the harmonization of the interaction between the two. The effective application of theoretical learning in schools is built upon the context learning generated in the workplace. The experiential learning, situational learning, and reflective learning gained from working in the workplace are transformed into learners' professional and critical abilities. This process depends on the cooperation of school learning. Therefore, the two complement each other, neither being dispensable[4-5].

#### **3.2. The content of industry-academia cooperative education**

The content of industry-academia cooperative education includes:

Firstly, Curriculum design: It is necessary to design a curriculum that meets the needs of the industry and is in line with the academic objectives of the school, to ensure that students can acquire practical and theoretical knowledge.

Secondly, Mentorship system: A mentoring system should be established to provide students with professional guidance and support from both school and industry mentors.

Thirdly, Internship planning: The planning of internships should be arranged in advance, and internships should be arranged in partnership with industry partners to ensure that students can obtain practical experience and apply theoretical knowledge in real-world situations.

Fourthly, Performance evaluation: The performance of students in industry-academia cooperative education should be evaluated comprehensively, including academic performance, practical performance, and personal qualities.

Fifthly, Industry-academic communication: Effective communication between schools and industries should be established to ensure the continuous improvement of industry-academia cooperative education and promote the exchange of resources between the two.

#### **3.3. Mechanism Analysis of industry-academia cooperative education**

The industry-academia cooperative education management mechanism mainly includes three parts: planning, implementation, and evaluation.

##### **3.3.1. Planning**

Industry-academia cooperative education includes two learning scopes: workplace learning and school learning. The overall program planning is more complex than usual. In addition to planning the training system or learning courses for both industry and academia and closely coordinating with course resources, it is also necessary to establish relevant rules and regulations for compliance and implementation[6]. This article discusses the planning aspects of the management mechanism for industry-academia cooperative education, including rules and regulations, management approaches, organizational structure, curriculum planning, budget allocation.

Firstly, Rules and Regulations. Rules and regulations can clearly define the rights and obligations of stakeholders, providing a basis for the subsequent development of activities. Industry-academia cooperative education involves cooperation with external enterprises, and the industry and academia may have different understandings and attitudes towards the cooperation. Therefore, it is necessary to establish rules and regulations to clarify relevant cooperative matters.

Secondly, Management approaches. The choice of different management approaches depends on the organizational culture of the school institution and the degree of support received from senior management. The size of the school institution, the nature of the academic curriculum, and the composition and characteristics of the teachers also affect the school's choice of management approach. Therefore, schools should choose the most appropriate management approach based on their own conditions and limitations, in order to maximize school performance and student learning outcomes.

Thirdly, Organizational Structure. Organizational Structure. The success of industry-academia

collaboration education depends on close cooperation between businesses and school institutions, which relies on the overall organizational structure of industry-academia collaboration education. According to its functional nature, this includes the director of the management function for professional learning, the faculty coordinator and full-time coordinator of the coordination function, as well as administrative staff, academic units and management information systems for the support function.

Fourthly, Curriculum Planning. Curriculum planning is the preparation for curriculum design, which aims to communicate educational philosophy and establish curriculum structure. It should measure the internal and external environment and conditions of the school in advance to identify the current situation, so as to pragmatically establish school vision, develop educational objectives, and establish curriculum goals based on them.

Fifthly, Budget Allocation. The promotion of industry-academia cooperation in education should be accompanied by appropriate resource allocation to ensure the smooth implementation of the administrative management of this education program. Therefore, the start-up costs and subsequent operating costs of this program should be carefully considered. On the other hand, the funding sources supporting these costs should also have a meticulous financial plan to ensure the efficiency and rationality of the program's promotion.

### **3.3.2. Implementation**

After careful planning of workplace learning and school learning, as well as relevant rules and regulations, industry-academia cooperation in education understands the needs of both sides through marketing and promotion. Then, it develops procedures for workplace learning placement and conducts course design to facilitate subsequent workplace training and school teaching implementation.

Firstly, Marketing and promotion. When planning for industry-academia cooperation in education, market research should be conducted based on the manpower needs of the industry and society, as well as the interests and needs of the students, to determine the necessity of the cooperation program. Then, promotional activities should be carried out targeting the intended market.

Secondly, Workplace placement and counseling. Industry-academia cooperation in education is essentially an educational form that uses the workplace as a training ground. Therefore, effective workplace placement is a key element in achieving educational objectives such as experiential learning and career development in industry-academia cooperation education.

Thirdly, Curriculum Design. In terms of promoting curriculum design strategies, schools must establish curriculum design teams to design teaching outlines and schedules, organize and manage the order of the curriculum, arrange teaching activities (classroom teaching or remote teaching, etc.) and desired outcomes of teaching courses and programs, etc. However, curriculum design does not necessarily require educators to create new courses. They can also adjust and transform existing courses in response to the school's needs. Industry-academia cooperation in education is an important part of overall technical and vocational education curriculum. In order to ensure that students can maximize the benefits of workplace learning, curriculum design should grasp the connectivity, applicability, and integration of the curriculum, and take the requirements of industry job skills as the core, focusing on competency-based education. Properly arranging the learning schedule and process of both in-school and out-of-school courses or programs, students can gradually develop the necessary professional skills under the coordination of teaching and curriculum design.

Fourthly, Implementation of Workplace Training. The workplace learning environment is an important factor in satisfying workplace placements, which allows students to get close to their supervisors and colleagues to obtain guidance, support, and feedback. Due to the dynamic changes in the workplace and differences in student characteristics, students should negotiate with the employer-designated supervisors on the content and timing of workplace learning at each stage, which can become the basis for evaluating student learning outcomes. Such assessments should also

reflect the needs and context of specific workplaces.

### **3.3.3. Evaluation**

In the trend of higher education emphasizing performance accountability, regular assessment of the success of educational programs is crucial, especially for industry-academia cooperation education[7]. The value and effectiveness of different stakeholders' interests should be elucidated through empirical research, including workplace learning assessment, school curriculum evaluation, and the overall implementation of industry-academia cooperation education management mechanisms.

Firstly, Workplace learning assessment. Workplace learning assessment helps students understand their work preparedness. As workplace learning assessments usually involve the participation of employers, they establish a valuable link between the working world and academic world. They ensure the reliability and validity of the assessment and recognize the employer's contribution to the student's understanding and development (Hodges, Smith & Jones, 2004). However, due to individual differences among students and different contexts of the workplace, how to establish a reasonable and fair evaluation method to effectively measure students' learning outcomes is a challenging issue for practical practitioners of industry-academia cooperation education.

Secondly, School curriculum evaluation. School curriculum evaluation refers to curriculum management from the school level, focusing on the school as a case study. This evaluation approach is complementary to the "holistic evaluation" approach. Curriculum management is the process of organizing and negotiating curriculum plans, integrating internal and external needs, addressing issues related to implementing school reforms, and negotiating curriculum interests and powers. This includes the proper arrangement and effective management of curriculum elements, including the design and practice of various management strategies and the management processes involved in interactions between collectives and individuals, affairs, and environments.

Thirdly, Overall implementation effectiveness. Cooperative education between industry and academia also requires us to examine the appropriateness of work content and processes, as well as balance the needs of stakeholders[5]. In order for the management mechanism of cooperative education between industry and academia to play its role in coordinating and integrating the resources and goals of both industry and academia, allowing students to obtain learning opportunities that combine theory and practice, and satisfying the needs of stakeholders, its actual implementation effectiveness can only be known through practical evaluations. Based on the evaluation results, feedback is provided, further corrections and improvements are made, and the management mechanism is improved towards perfection.

## **4. Conclusion**

The management mechanism of cooperative education between industry and academia can be divided into three dimensions: planning, execution, and evaluation, which links workplace learning and school learning. Only when the two complement each other can the collaborative effectiveness of both industry and academia be maximized, in order to maximize the learning benefits of students. The management mechanism of cooperative education between industry and academia, in actual implementation, selects different course content and course nature for workplace learning based on considerations such as school level, student characteristics, and the nature of the department. In addition, the management methods and organizational structure also vary depending on the scale of the students participating in off-campus internships.

The goal of the management mechanism of cooperative education between industry and academia is to provide students with high-quality learning experiences in both the workplace and school in order to cultivate their professional and key abilities. Therefore, it relies on the participation and investment of both industry and academic partners, as well as the cooperation and support of relevant administrative resources. Through this experience, students can learn, experience different contexts, and reflect on their learning opportunities, which helps to enhance

individual self-growth.

## References

- [1] Salpie S. D., Wassim S. (2022). Academia–business cooperation: A strategic plan for an innovative executive education program. *Industry & Higher Education*,17(2):157-164.
- [2] L. Li, Chen Q., Jia X., E. Herrera-Viedma. (2020). Co-patents’ commercialization: evidence from China. *Economic Research-Ekonomska Istraživanja*, 34(1):1709-1726
- [3] Sharrock G. (2012). Four management agendas for Australian universities. *Journal of Higher Education Policy and Management*, 34 (3): 323-337.
- [4] Demarinis Loiotile, A.; DeNicolò, F.; Agrimi, A.; Bellantuono,L.; La Rocca, M.; Monaco, A.; Pantaleo, E.; Tangaro, S.; Amoroso,N.; Bellotti, R. (2022). Best Practices in Knowledge Transfer: Insights from Top Universities. *Sustainability*,14, 15427.
- [5] di Berardino, D.; Corsi, C.( 2018). A Quality Evaluation Approach to Disclosing Third Mission Activities and Intellectual Capital in Italian Universities. *J. Intellect. Cap.*, 19, 178–201.
- [6] Giuri P.; Munari F.; Scandura A.; Toschi L. (2019).The Strategic Orientation of Universities in Knowledge Transfer Activities. *Technol Forecast Soc. Change*, 138, 261–278
- [7] Loukkola T. (2016). Europe: Impact and Influence of Rankings in Higher Education. In *Global Rankings and the Geopolitics of Higher Education*; Routledge: London, UK, 127–139.