

PROBLEMS AND SUCCESS FACTORS FOR INDUSTRY EDUCATION COOPERATION

Fu Xianquan¹, Kittirat Thansuwansni², Sombat Teekasap³, Nukul Sarawong⁴

¹Luzhou Vocational and Technical College, Sichuan, 646000, China

^{2,3,4} Bansomdejchaopraya Rajabhat University, Bangkok 10600, Thailand

* Corresponding author e-mail: 25889851@qq.com

Received, 5 January 2024

Revised, 4 March 2024

Accepted, 20 March 2024

Abstract

The deep industry-education cooperation is an important feature of higher vocational education and an important path for talent cultivation in higher vocational education. To understand the current problems and key success factors of industry-education cooperation in Sichuan, 21 experts from universities, industries and educational administrative departments were consulted by using questionnaires, and the conclusions were confirmed by 5 experts from universities who are good at industry-education cooperation, industry management or data analysis. The results show that there are some problems in industry-education cooperation, such as a lack of favourable cooperation environment support, insufficient resource sharing, poor communication and coordination, insufficient cooperation and coordination, and insufficient organizational support; The investment and support from universities, industries, and governments, the social and industrial structure in the external environment, technological innovation and transformation, policies and systems in the external environment, and the operation, communication, and organizational guarantee mechanisms in industry-education cooperation are the key factors that affect the success of industry-education cooperation.

Keywords: Vocational Colleges, Industry-education Cooperation, Problems, Success Factors

Introduction

Rationale

Since the 18th National Congress of the Communist Party of China, China's economic development has shifted towards a stage of high-quality development, and the industrial structure has further transformed and upgraded. The adjustment of industrial structure will inevitably result in changes to the employment environment. Jenkins (2019) delves into the correlation between adaptability and employment, asserting that employees who swiftly adapt to new work environments, technologies, and challenges experience higher employment rates and salary levels. Stuart (2020) proposed in his research that the cultivation of students' professional competencies should be closely aligned with the demands of industrial development. This is to ensure that students can successfully integrate into the workplace while also having broader career development opportunities, in response to the constantly changing needs of industries. Education and industry is an important approach to enhancing the capabilities of vocational college students. However, Huang (2022) found in practice that there are still problems such as a mismatch between talent training quality and social demand. Therefore, based on the literature survey and the results design a questionnaire to survey universities, industries and educational administration experts' opinions, and then interview experts to confirm the current problems and success factors of industry-education cooperation, providing important information for the subsequent design of an industry-education cooperation model optimize the management to enhance student working competency cultivation.

Research Objective

To identify and confirm the current problems and key success factors of industry-education cooperation.

Literature review

In recent years, China's vocational education has shifted from following the general education model to a type of education with industry social participation and distinctive professional characteristics, which has triggered a large number of experts and scholars to explore the deepening of the industry-education cooperation. Through sorting out and analyzing existing research both domestically and internationally, the current problems and key success factors of the industry-education cooperation can be summarized as follows:

1. The current problems of industry-education cooperation

Xie (2022) analyzed the main participants in industry-education cooperation, considering the government, industries, and universities as the three primary entities. However, these three entities often have diverse needs and priorities, leading to difficulties in coordinating their relationships and potentially resulting in challenges in aligning collaborative

plans. Huang (2021) proposed that industry-education cooperation requires support from both internal and external cooperative environments. Nevertheless, Chen et al. (2023) found from the perspective of the environment of industry-education cooperation that there are currently problems such as relatively lagging professional settings, a disconnection between professional scale and industrial scale, and insufficient capability for different vocational colleges in different regions to connect with regional economic industries, layout, and create advantageous and distinctive speciality capabilities. Zhao (2020) conducted a study on the policies related to industry-education cooperation and discovered problems such as incomplete policies, lack of policy coordination, inadequacy of measures, and weak operational feasibility. Chu et al. (2022) also identified problems in industry-education cooperation, including incomplete evaluation standards, a lack of effective supervision, and an inadequate evaluation mechanism. Yu (2023) found through research that current industry-education cooperation is lacking in aspects such as jointly formulating talent training programs and collaboratively discussing professional settings and adjustments. There is also a shortage of shared teaching resources and content, resulting in low allocation and utilization rates of industry-education cooperation resources and obvious superficial cooperation. Luo's study (2018) explored the problem of organizational support in industry-education cooperation, finding that there is a lack of necessary organizational support, insufficient financial support, and inadequate policy formulation and implementation. Yao (2019) also pointed out that due to inadequate organizational support, there is insufficient overall consideration in industry-education cooperation and it is difficult to achieve long-term and in-depth cooperation. Asmara, et al. (2020) found that industry-education cooperation current problems such as insufficient ability to communicate and resolve conflicts, insufficient depth of coordination or shallow communication. Pan et al. (2019) conducted research indicating that industry-education cooperation involves the coordinated development of multiple departments and roles. If the communication mechanism is lacking, it is easy to present a loosely coupled state of cooperation with low effective coordination, leading to insufficient communication and conflict resolution skills. Peng (2019) discovered through interviews that the funding for vocational colleges and the combined incentive mechanism of "finance + finance + land + credit" in current industry-education cooperation are not yet sound enough. Lack of effective supervision from the government and industries makes it difficult to effectively evaluate industry-education cooperation and promote it further. Lu et al. (2023) believe that the interests of industry-education cooperation are not effectively matched, which makes it impossible to maintain long-term and sustained cooperative relationships. Without participating in the whole process of talent cultivation fundamentally, the level of cooperation remains low and not deep enough, and the phenomenon of "cooperation without harmony" still exists.

2. The key success factors of industry-education cooperation

The success of industry-education cooperation is influenced by various factors. Gibson et al. (2019) suggest that internal factors, coupling factors, and external environmental factors can all impact industry-education cooperation. Wang (2019) points out that the government, industries, and universities are the three primary entities of industry-education cooperation, and their awareness, nature and scale of cooperation, and resource investment have an impact on cooperation. In addition, Neudic, et al. (2022) and Nsanzumuhire, et al. (2020) emphasize that the strength of government support and the active play of functions are important factors for the success of industry-education cooperation. Tu et al. (2018) believe that the further advancement of industry-education cooperation cannot be separated from external conditions and demand environments. Therefore, Zhang (2020) proposes the establishment of industry-education cooperation platforms, such as the adaptation of professional settings to industrial structures, the construction of inter-provincial and municipal industry-education cooperation bodies, and the construction of industry-education cooperation bodies at the sector level. Sjö et al. (2019) and Puerta-Sierra (2019) believe that society is currently in a period of rapid technological change, and technological innovation and transformation will inevitably affect industry-education cooperation, such as patent numbers, high-tech manufacturing and export volumes, intellectual property income, and innovative talents. Chanapai (2018) finds that policies and systems are important external environmental factors for industry-education cooperation, such as local support, regulations, legal operations, and organizational guarantees. Sun et al. (2021) points out that resource sharing mechanisms can achieve effective resource flow and functional complementarity. Albats et al. (2020) believe that organizational guarantee mechanisms, such as government networks, public funds, tax incentives, or human resources, can promote the development of industry-education cooperation. In addition, Bstieler et al. (2017) find that communication and coordination mechanisms enable all parties involved in cooperation to understand each other better, and their interests and demands can be fully expressed, which is conducive to establishing positive expectations for future behavior. Golja et al. (2018) further point out that appropriate benefit balancing mechanisms can help achieve a win-win situation of balanced benefits, making cooperation more sustainable and efficient.

From these literature sources, it can be found that industry-education cooperation is a complex and multi-dimensional system, current problems and success factors have many different interpretations in specific scenarios. Therefore, different methodological frameworks are needed to gain an in-depth understanding of current problems and success factors in different contexts through detailed investigation research, to further develop a new conceptual model and provide more scientific suggestions for practice and policy formulation.

Research Methodology

To identify the current problems and success factors of the industry-education cooperation, research tools for data collection and data analysis as shown in follow research framework.

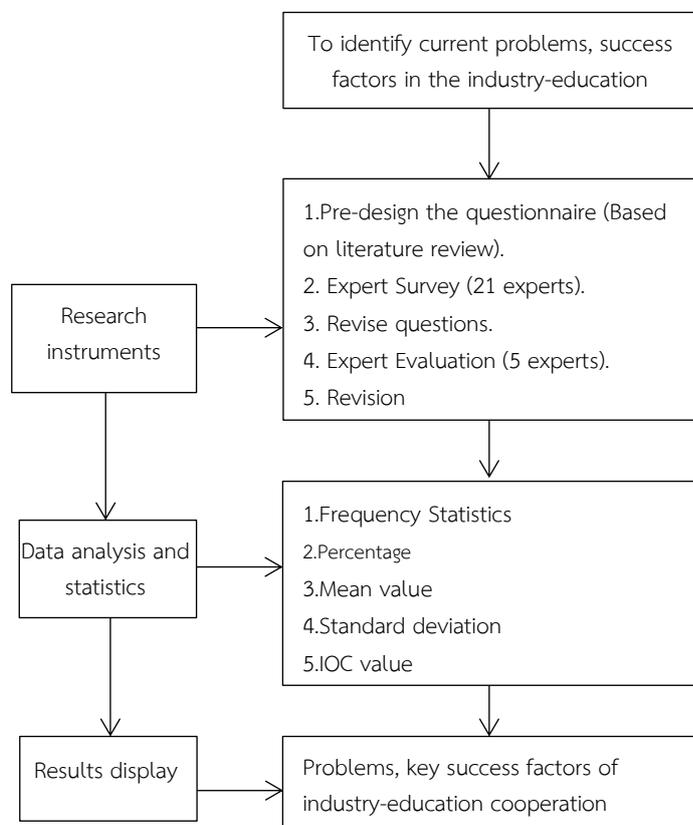


Figure 1 Research Framework

Population and Samples

Purposive sampling was used to invite 21 experts, 9 experts holding the title of professor or having doctoral degrees, each with over 10 years of experience in industry-education cooperation management. 9 experts holding positions such as manager, general manager, or chairman, each with over 10 years of experience in industry-education cooperation management. and 3 experts engaged in the Government education management Department, each with over 5 years of experience industry-education cooperation management.

Research Tools

Design an expert survey questionnaire on current problems and success factors related to industry-education cooperation based on a literature review, with options of "agree" (1 point), "partially agree" (0 point), or "disagree" (-1 point). Experts make choices based on their own understanding, choosing "partially agree" or "disagree", and need to provide

explanations or justifications. Determine the consistency of expert opinions using frequency, mean, standard deviation.

Process

(1) Develop a questionnaire. Based on literature review, develop an expert survey questionnaire, which includes the topic name, research purpose, background of the respondents, specific details, and other related questions.

(2) Expert investigation. 21 experts were invited to evaluate the questionnaire, 21 questionnaires were distributed and 21 were collected, all of which were valid.

(3) Data analysis and application. Analyze feedback data from 21 experts, for questions below 75%, modified based on explanations or justifications provided by experts, and solicit expert opinions again.

(4) Expert confirmation. Compile the steps, processes, and results of the previous steps into an expert evaluation form, solicit opinions from 5 experts, proficient in questionnaire surveys, a professorial or doctoral degree, with over 10 years of experience in vocational education or management, and confirm the effectiveness of each item.

Results

1. Analyze the current problems of industry-education cooperation

According to the survey results of 21 experts, there are 8 problems commonly agreed upon by experts in industry-education cooperation, including lack of coordination in industry and education cooperation, Lack of Supportive Cooperative Environment, Imperfect Policies and Systems, insufficient resource sharing, Inadequate Organizational Support, Communication and Coordination Hindered, Benefits not effectively matched, and Low-Level and Superficial Cooperation (Table 1)

Table 1 Current Problems in Industry Education Cooperation

First level problem	Second level problem	Percentage	Mean-value	Standard Deviation	IOC	Mean-value	Standard Deviation
Lack of Coordination in Industry-Education Cooperation	Goals among Government, Educational Institutions, and Industrys are not completely consistent in industry-education cooperation	100%	1.000	0.000	1.000	0.889	0.383
	The cooperation philosophy is not completely the same between the University and the Industry	95.24%	0.952	0.213	0.905		
	Divergent Value Orientations between the University and the Industry	80.95%	0.714	0.628	0.657		

Table 1 (Continue)

First level problem	Second level problem	Percentage	Mean-value	Standard Deviation	IOC	Mean-value	Standard Deviation
Lack of Supportive Cooperative Environment	Some university's major offerings are not well-matched with local industries.	100%	1.000	0.000	1.000	0.968	0.174
	The content and Infrastructure are not completely matched for industry-education cooperation	95.24%	0.952	0.213	0.905		
	Insufficient Technology Transfer and Transformation between the University and Industry	95.24%	0.952	0.213	0.905		
Imperfect Policies and Systems	Incomplete Legal and Regulatory Framework for industry-education cooperation	85.71%	0.810	0.499	0.733	0.841	0.463
	Lack of Effective Oversight and Evaluation Mechanisms for industry-education cooperation	80.95%	0.714	0.628	0.657		
	The constraints of the current educational administrative management system	100%	1.000	0.000	1.000		
Insufficient resource sharing	Teaching resources and content not built and shared	80.95%	0.762	0.526	0.662	0.921	0.304
	Facilities(spare), venues, etc. have not been fully co-constructed and shared.	100%	1.000	0.000	1.000		
	Both universities and industries have not fully sent or trained teachers to each other	100%	1.000	0.000	1.000		
Inadequate Organizational Support	Lack of necessary financial support	90.48%	0.857	0.467	0.814	0.881	0.387
	Lack of necessary personnel support	85.71%	0.810	0.499	0.733		
	Lack of effective supervision mechanism	90.48%	0.905	0.294	0.819		
	Teaching resources, lack of necessary incentive measures	95.24%	0.952	0.213	0.905		
Communication and Coordination Hindered	Insufficient depth of communication and coordination	90.48%	0.905	0.294	0.819	0.905	0.366
	Insufficient ability to communicate and resolve conflicts	95.24%	0.905	0.426	0.905		
Benefits not effectively matched	Uneven distribution of benefits	90.48%	0.857	0.467	0.814	0.833	0.530
	Unbalanced cost-sharing and compensation	90.48%	0.810	0.587	0.819		
Low-Level and Superficial Cooperation	Poor stability and durability of industry-education cooperation	80.95%	0.714	0.628	0.657	0.833	0.469
	Insufficient connection between education chain, talent chain, industry chain, and innovation chain	95.24%	0.952	0.213	0.905		

According to Table 1, 21 experts hold a positive attitude towards the current problems in industry-education cooperation. The top 3 problems ranked in order are the lack of a supportive cooperative environment ($\bar{x}=0.968$, $SD=0.174$), insufficient resource sharing problem ($\bar{x}=0.921$, $SD=0.304$) and communication and coordination hindered ($\bar{x}=0.905$, $SD=0.366$); Following closely behind is lack of coordination in industry-education cooperation ($\bar{x}=0.889$, $SD=0.383$), inadequate organizational support ($\bar{x}=0.881$, $SD=0.387$), imperfect policies and systems ($\bar{x}=0.841$, $SD=0.463$), with the lowest scores being the problem of benefits not effectively matched and the problem of low-level and superficial cooperation ($\bar{x}=0.833$), but the difference in expert opinions on the problem of benefits not effectively matched ($SD=0.530$) is greater than that on the problem of low-level and superficial cooperation ($SD=0.469$).

The results of the 8 questions on current industry-education cooperation from different expert groups in universities, industries, and government were compared and analyzed. There were certain differences among different expert groups on the current problems (Table 2).

Table 2 Comparison of Results from Different Expert Groups

No.	problems	University Expert Group		Industry Expert Group		Government Expert Group	
		Mean-value	Standard Deviation	Mean-value	Standard Deviation	Mean-value	Standard Deviation
1	Lack of Coordination in Industry-Education Cooperation	0.926	0.256	0.815	0.480	1.000	0.000
2	Lack of Supportive Cooperative Environment	0.963	0.181	1.000	0.000	0.889	0.272
3	Imperfect Policies and Systems	1.000	0.000	0.630	0.615	1.000	0.000
4	Insufficient resource sharing	0.927	0.240	0.889	0.385	1.000	0.000
5	Inadequate Organizational Support	0.972	0.157	0.778	0.521	0.917	0.236
6	Communication and Coordination Hindered	1.000	0.000	0.778	0.533	1.000	0.000
7	Benefits not effectively matched	1.000	0.000	0.612	0.753	1.000	0.000
8	Low-Level and Superficial Cooperation	0.889	0.445	0.723	0.533	1.000	0.000

According to Table 2, the consistency among the university expert group's opinions on the eight problems existing in industry-education cooperation is relatively high ($\bar{x}<0.850$, $SD <0.500$). Among them, there is a unanimous agreement on 3 problems: imperfect policies and systems, poor communication and coordination, and an ineffective matching of interests

(\bar{x} =1.000, SD =0.000). The consistency among the industry expert group's opinions on the current problems in industry-education cooperation is lower than that of the university expert group, especially regarding the ineffective matching of interests (\bar{x} =0.612, SD =0.753) and imperfect policies and systems (\bar{x} =0.630, SD =0.615), where there is significant disagreement among experts. The reason for the low consistency in the ineffective matching of interests may be due to differences in the distribution of the actual benefit among different companies in industry-education cooperation, resulting in varying expert conclusions. The reason for the low consistency in imperfect policies and systems may be due to most of the policies and systems related to industry-education cooperation coming from the education field, leading to varying levels of understanding among different companies. The government expert group unanimously agrees on six of these problems (\bar{x} =1.000, SD =0.000), but there is some disagreement regarding inadequate organizational support (\bar{x} =0.917, SD =0.236) and a lack of favorable support from the cooperative environment (\bar{x} =0.889, SD =0.272).

2. Analyze the success factors of industry-education cooperation

21 experts have a very positive attitude towards the key success factors affecting industry-education cooperation, with a high degree of consensus. They have given consistent conclusions on 10 success factors (\bar{x} >0.900, SD <0.237) (Table 3).

Table 3 Success Factors of industry-education cooperation

First level factors	Second level factors	Percentage	Mean-value	Standard Deviation	IOC	Mean-value	Standard Deviation
University Resource Investment	Have a sense of industry-education cooperation	100%	1.000	0.000	1.000	1.000	0.000
	Possesses the capability for industry-education cooperation	100%	1.000	0.000	1.000		
	The basic conditions for industry-education cooperation	100%	1.000	0.000	1.000		
	invested resources in industry-education cooperation	100%	1.000	0.000	1.000		
Industry Resource Investment	The concept of industry-education cooperation	85.71%	0.857	0.350	0.743	0.937	0.237
	The nature and scale	100%	1.000	0.000	1.000		
	Invest resources in industry-education cooperation	95.24%	0.952	0.213	0.905		
Government Support Intensity	Formulates policies and regulations	100%	1.000	0.000	1.000	1.000	0.000
	Supervision of the implementation process	100%	1.000	0.000	1.000		
	Quality supervision and evaluation	100%	1.000	0.000	1.000		

Table 3 (Continue)

First level factors	Second level factors	Percentage	Mean-value	Standard Deviation	IOC	Mean-value	Standard Deviation
Social Industrial Structure	Matching Industrial Structure with University Professional Structure	100%	1.000	0.000	1.000	1.000	0.000
	Provincial and municipal platform carriers	100%	1.000	0.000	1.000		
	Social recognition of vocational education for cultivating skilled talents	100%	1.000	0.000	1.000		
	Social media promotion and reporting	100%	1.000	0.000	1.000		
Technological Innovation and Transformation	The demand of technological change for the cultivation of skilled talents	100%	1.000	0.000	1.000	1.000	0.000
	Application and transformation of new technological achievements	100%	1.000	0.000	1.000		
Policies and Institutions	Implementation of the national, provincial, and municipal system	100%	1.000	0.000	1.000	1.000	0.000
	Proper measures taken to promote projects	100%	1.000	0.000	1.000		
Resource sharing mechanism	Resource flow and functional complementarity	100%	1.000	0.000	1.000	1.000	0.000
	Resource sharing	100%	1.000	0.000	1.000		
Organizational support mechanism	financial guarantee	100%	1.000	0.000	1.000	1.000	0.000
	personnel guarantee	100%	1.000	0.000	1.000		
	Reward and punishment mechanism	100%	1.000	0.000	1.000		
Communication and cooperation mechanism	Coordinated governance mechanism	100%	1.000	0.000	1.000	1.000	0.000
	Smooth communication channels	100%	1.000	0.000	1.000		
	Appropriate frequency of information communication	100%	1.000	0.000	1.000		
Interest balance mechanism	Reasonable distribution of benefits	100%	1.000	0.000	1.000	1.000	0.000
	Cost sharing and compensation are reasonable	100%	1.000	0.000	1.000		

According to Table 3, 21 experts have a highly consistent view on the key factors for the success of industry-education cooperation. Among the 10 factors, except of industry resource investment ($\bar{x}=0.937$, $SD=0.237$), the investment of university resources, government support, social industrial structure, technological innovation and transformation, policies and systems, resource sharing mechanisms, organizational guarantee mechanisms, communication and coordination mechanisms, and interest balance mechanisms have all been unanimously recognized by all experts ($\bar{x}=1.000$, $SD=0.000$). Among the 28 secondary factors, 26 out of them received 100% agreement.

Industries have the concept of industry-education cooperation (PCT=85.71%, IOC=0.743) and Invest resources in industry-education cooperation (PCT=95.24%, IOC=0.905),

Although there are some slight differences, the overall attitude of the experts is very positive, and the overall conclusion tends to be consistent.

3. Confirm the current problems and success factors of industry-education cooperation

Provide the original questionnaire and data analysis results, retest analysis results of the revised questionnaire to 5 experts who have been engaged in long-term industry-education cooperation, questionnaire surveys, and other aspects of testing research tools. The 5 experts will check the effectiveness of each question item by item and independently evaluate it. The options are "agree" (1 point), "partially agree" (0 point), or "disagree" (-1 point). Experts make choices based on their understanding. If they choose "partially agree" or "disagree", they need to provide explanations (Table 4).

Table 4 Confirm problems and success factors of industry-education cooperation

Assessment objectives	Aspects Evaluated	Evaluate the Content	Percentage	Mean-value	Standard Deviation	IOC
Confirm the current problems and success factors of industry-education cooperation	Reasonableness of the problem	The questions are closely related to the research objectives and the number is reasonable	100%	1.000	0.000	1.000
	Clarity of expression	The expression is appropriate, clear and unambiguous	100%	1.000	0.000	1.000
	Completeness of content	The content is relatively comprehensive and covers the problems and success factors of industry-education cooperation	100%	1.000	0.000	1.000
	Standardization of the process	Standardization of data collection, analysis and questionnaire revision process	100%	1.000	0.000	1.000
	Validity of the conclusion	The conclusions on the current problems and success factors of industry-education cooperation are valid	100%	1.000	0.000	1.000

According to Table 4, 5 experts unanimously agree on the current problems and success factors of industry-education cooperation (PCT=100%, IOC=1.00), indicating the validity of the questionnaire and conclusions.

Conclusion

This study summarizes and reflects on the problems and success factors of industry-education cooperation. Due to the objective and subjective limitations of the survey questionnaire options, the development of the connotation of industry-education cooperation is also keeping pace with the times, and some viewpoints still need further verification and deepening.

1. Supportive cooperative environment for industry-education cooperation needs to be improved

According to table 1, the lack of a supportive cooperative environment is the most prominent problem in current industry-education cooperation, which is highly recognized by both university and industry expert groups (table 2). From the perspective of macro policies and the institutional environment for industry-education cooperation, the existing education administration system in China does not provide sufficient autonomy for both parties, resulting in poor flexibility and resilience in industry-education cooperation. From the perspective of the micro-environment for industry-education cooperation, higher vocational colleges have not adjusted their professional structures on time to proactively adapt to market demand, industrial structure, and technological innovation development. As a result, industry-education cooperation cannot better meet the high-skilled personnel of industrial development. This is consistent with the conclusions of Huang (2021), and Chen et al. (2023).

2. Resource sharing in industry-education cooperation needs to be strengthened

According to table 1, insufficient resource sharing restricts the deep development of industry-education cooperation, which is widely recognized by university expert groups, industry expert groups, and government expert groups (table 2). Currently, some industry-education cooperation only stays at the primary level of student internships, practical training, and human resource supply from industries. The sharing of teaching resources, facilities (such as equipment), venues, and teachers is insufficient, which is consistent with the research conclusions of Yu (2023) mentioned earlier.

3. Communication and coordination hindered in industry-education cooperation need to be improved

According to table 1, communication and coordination hindered limits the quality of industry-education cooperation, which is highly recognized by all three expert groups (table 2). The cooperation of production and education involves the investment of both universities and industries in terms of people, finance, and materials. However, due to the imperfect mechanism construction, it is difficult for school-industry cooperation, which mainly adopts project cooperation mode, to achieve deep communication and coordination, resulting in insufficient implementation and stability in the cooperative relationship. This is consistent with the research conclusions of Zhao (2020) Chu et al. (2022) Thune (2016) and Pan et al. (2019).

4. Coordination in industry-education cooperation needs to be strengthened

According to table 1, lack of coordination in industry-education cooperation affects sustainable development, which is highly recognized by university expert groups, industry expert groups, and government expert groups (Table 2). Due to significant differences in interests and demands among the three main bodies of government, universities, and

industries, as well as differences in cooperation goals and concepts, coupled with imperfect mechanism construction, there are problems such as insufficient collaboration and shallow cooperation levels in school-industry cooperation. This is consistent with the research conclusions of Xie (2022), and Lu et al. (2023).

5. The success factors of industry-education cooperation are complex and multidimensional

According to table 3, there are 10 success factors for industry-education cooperation. The 10 factors can be mainly divided into three dimensions, including the main body of industry-education cooperation, an environment of industry-education cooperation, and the mechanism of industry-education cooperation. In the dimension of the main body, investment in university resources, industry resources, and government support are the key factors that promote the success of industry-education cooperation; In the dimension of the environment, the industrial structure, technological innovation and transformation, policies and systems of society are important components of the economic and social environment, and have become important factors affecting the success of industry-education cooperation; In the dimension of the mechanism, improving a comprehensive institutional mechanism is necessary to ensure the smooth operation of industry-education cooperation. Resource sharing mechanism, communication and coordination mechanism, interest balance mechanism, and organizational guarantee mechanism are necessary factors for the success of industry-education cooperation.

References

- Albats, E., Bogers, M., & Podmetina, D. (2020). Human Capital in Company-University Cooperation: A Microfoundations Perspective. *Technological Forecasting and Social Change*. Retrieved from <https://doi.org/10.1016/j.techfore.2020.120085>.
- Asmara, A., & Ming-Chang, W. (2020). An Analytical Study on Effective Approaches to Facilitate Cooperation between Higher Education and Industry: Based on Faculty Members' Perspective. *TEM Journal*, 9(4), 1721.
- Bstieler, L., Hemmert, M., & Barczak, G. (2017). Changes in the Foundation of Trust Formation in Inter-Organizational Relationships: A Binary Study of Industry-education Research Cooperation. *Journal of Industry Research*, 74, 47-54.
- Chanapai S, Suttawet C. (2018). Cooperation between public and private sectors in providing workforces and development of labour efficiency in the motorcycle industry. *Kasetsart Journal of Social Sciences*, 18,1-6.
- Chen, L., Hu, Y., Zhang, Z., & Xi, L. (2023). Combining Industry and Education to Cultivate Students' Creativity and Execution with “Real Problems”. *Higher Engineering Education Research*, 05, 65-69.

- Chu, X., & Li, L. (2022). Problem Analysis and Optimization Strategies for Domestic Regional Industry education cooperation Policies. *Industrial Innovation Research*, 24, 180-182.
- Ćudić, B., Alešnik, P., & Hazemali, D. (2022). Factors Impacting industry-education cooperation in European Countries. *Journal of Innovation and Entrepreneurship*, 11(1), 33.
- Golja, T., McClean, S., & Jordan, K. (2018). Collective learning in an industry-education-research test bed. *Transdisciplinary Theory, Practice and Education: The Art of Collaborative Research and Collective Learning*, 185-199.
- Gioia, F. (2019). Industry-education Cooperation: An Industry Perspective. *Management Decision*, 57(12), 3258-3279.
- Huang, J. (2022). An Exploration of the University Talent Cultivation Model Based on Industry-education cooperation. *Talent Development*, 23(10), 82-84.
- Huang, Y. (2021). *Problems and Strategies for Industry-Education Cooperation in Hengxing Vocational Education Group* (Master's thesis, Qingdao University of Science and Technology).
- Luo Y. (2018). *Government Support in the Development of Higher Vocational Education in Guangdong* (Master's thesis, Guangxi Normal University).
- Lü, Y., Ding, L., & Zhou, Y. (2023). Problems and Paths for Deepening Industry-Education Integration in Higher Vocational Education in Henan Province. *Education Management*, 19, 54-58.
- Nsanzumuhire, S. U., & Groot, W. (2020). Context perspective on Industry-education Cooperation processes: A systematic review of literature. *Journal of Cleaner Production*, 258, 120861.
- Pan, H. S., & Song, Y. F., & Wang, S. B. (2019). Construction of the Policy Framework for Industry-Education Cooperation in Vocational Education and Resolution of Dilemmas. *Journal of Jishou University: Social Sciences Edition*, 2019(04), 69-76.
- Peng, L. J. (2019). The Historical Evolution, Logical Starting Point, and Strategic Key Points of Industry-Education Integration in Vocational Education. *Education and Vocation*, 6, 19-25.
- Sjöö, K., & Hellström, T. (2019). Industry-education Collaboration: A Literature Review and Synthesis. *Industry and Higher Education*, 33(4), 275-285.
- Sun, Y. F., Zhang, X. W., & Fu, B. C. (2021). Construction of the Driving Mechanism for Industry-Education Cooperation in Local Universities. *Educational Exploration*, 1, 39-43.
- Tu, B., Sun, Y., & Ding, S. (2018). Measurement and evaluation of the level of industry-education cooperation in applied undergraduate colleges in Jiangsu Province from the macro perspective of synergy development between local industries and university majors. *Vocational and Technical Education*, 39(14), 50-54.

- Xie, J. H. (2022). Current Status, Problems, and Strategies of University(college)-Industry Cooperation in Higher Vocational Colleges in Hunan. *Journal of Hunan University of Humanities, Science, and Technology*, 4, 102-109.
- Yao, Y. L. (2019). Problems and Pathways in Industry-Education Cooperation in Higher Vocational Education. *Fujian Tea Leaves*, 7.
- Yu J. (2023). *Problems and Strategies in Industry-Education Cooperation in Higher Vocational Colleges under the "Double High Plan" in Hubei* (Master's thesis, Hubei University).
- Zhao, Y. (2020). Effectiveness of industry-education cooperation in Vocational industry-education cooperation. *Adult Education*, 40(1).
- Zhang, J. Y., & Miu, C. D. (2021). Substantive Governance of Vocational College Industry education cooperation from the Principal-Agent Perspective: Logic, Dilemmas, and Strategies. *Journal of National Education Administration Institute*, (4), 41-48.