

STRATEGIES FOR SUSTAINABLE DEVELOPMENT OF INDUSTRY-
EDUCATION INTEGRATION IN HIGHER VOCATIONAL
COLLEGES IN GUANGDONG PROVINCE

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A thesis paper submitted in partial fulfillment of the requirements for the Degree of
Doctor of Philosophy Program in Educational Management for Sustainable Development

Academic Year 2024

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Thesis Title Strategies for Sustainable Development of Industry-Education Integration in
Higher Vocational Colleges in Guangdong Province

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ABSTRACT

The objectives of this study were: 1) To examine the current status of the development of industry-education integration in higher vocational colleges in Guangdong Province; 2) To formulate strategies for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province; 3) Evaluate the suitability and feasibility of the sustainable development strategy at industry-education integration. The sample for this study consisted of 384 students and 361 teachers. Questionnaires were administered to participants from five exemplary higher vocational colleges. Additionally, 10 experts from 5 higher vocational colleges in Guangdong Province for the questionnaire survey. and 3 enterprises from Guangdong Province were interviewed, 25 experts evaluated the draft strategy, and 25 experts evaluated the strategy's suitability and feasibility. The research tools included 1) a Questionnaire, 2) Interview forms, 3) Strategies, and 4) an Evaluation form. The statistical methods used for data analysis included percentage, mean, standard deviation, and content analysis.

The study found that: 1) The current status of the development of industry-education integration in higher vocational colleges in Guangdong Province is at a relatively high level; 2) Strategies for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province were

proposed from 4 aspects and 19 measures; 3) The suitability and feasibility of the sustainable development strategy for industry-education integration were evaluated at the highest level.

Keywords: Industry-education integration, Sustainable development strategy, Higher vocational colleges, strategy

ชื่อเรื่อง	กลยุทธ์การพัฒนาอย่างยั่งยืนด้านการบูรณาการ อุตสาหกรรมและการศึกษาของวิทยาลัยอาชีวศึกษา ระดับสูง ในมณฑลกว่างตุง
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บทคัดย่อ

วัตถุประสงค์ของการวิจัยครั้งนี้ คือ 1) เพื่อตรวจสอบสภาพปัจจุบันของการพัฒนาการบูรณาการอุตสาหกรรม-การศึกษาในวิทยาลัยอาชีวศึกษาระดับสูง ในมณฑลกว่างตุง 2) เพื่อกำหนดกลยุทธ์การพัฒนาอย่างยั่งยืนด้านการบูรณาการอุตสาหกรรม-การศึกษาในวิทยาลัยอาชีวศึกษาระดับสูงในมณฑลกว่างตุง 3) ประเมินความเหมาะสมและความเป็นไปได้ของกลยุทธ์การพัฒนาอย่างยั่งยืนด้านการบูรณาการอุตสาหกรรม-การศึกษา กลุ่มตัวอย่างที่ใช้ในการวิจัยครั้งนี้ ได้แก่ นักศึกษา 384 คนและครู 361 คน ใช้แบบสอบถาม เก็บรวบรวมข้อมูลจากวิทยาลัยอาชีวศึกษาระดับสูงที่เป็นกลุ่มตัวอย่าง และมีการสัมภาษณ์ผู้เชี่ยวชาญ จำนวน 10 คนจากวิทยาลัยอาชีวศึกษาระดับสูง 5 แห่ง และรัฐวิสาหกิจ 3 แห่ง ประเมินร่างกลยุทธ์โดยผู้เชี่ยวชาญ จำนวน 25 คน และประเมินความเหมาะสม ความเป็นไปได้ของกลยุทธ์โดยผู้เชี่ยวชาญ จำนวน 25 คน เครื่องมือที่ใช้ในการวิจัย ประกอบด้วย 1) แบบสอบถาม 2) แบบสัมภาษณ์ 3) กลยุทธ์ และ 4) แบบประเมินกลยุทธ์ สถิติที่ใช้ในการวิเคราะห์ข้อมูล ได้แก่ ร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบน

มาตรฐาน และการวิเคราะห์เนื้อหา

ผลการวิจัยพบว่า 1) สภาพปัจจุบันของการพัฒนาอย่างยั่งยืนด้านการบูรณาการอุตสาหกรรม-การศึกษาของวิทยาลัยอาชีวศึกษาระดับสูง ในมณฑลกว่างตุงอยู่ในระดับสูง 2) กลยุทธ์การพัฒนาอย่างยั่งยืนด้านการบูรณาการอุตสาหกรรม-การศึกษาของวิทยาลัยอาชีวศึกษาระดับสูงในมณฑลกว่างตุง ใน 4 ด้าน ประกอบด้วย 19 มาตรการ 3) ความเหมาะสมและความเป็นไปได้ของกลยุทธ์การพัฒนาที่ยั่งยืนด้านการบูรณาการอุตสาหกรรม-การศึกษาอยู่ในระดับสูงสุด

คำสำคัญ: การบูรณาการอุตสาหกรรม-การศึกษา กลยุทธ์การพัฒนาอย่างยั่งยืน วิทยาลัยอาชีวศึกษา กลยุทธ์

Acknowledgement

First, I would like to express my deepest gratitude to my Major Advisor, Associate Professor Dr. Sarayut Setthakachorn and Phadet Kakhom, and my Co-Advisors, Associate Professor Dr. Areeya Juichamlong and Assistant Professor Dr. Phatchareephorn Bangkheow . Their rigorous academic standards, high expertise, and meticulous guidance have been invaluable throughout my doctoral journey. They have consistently provided professional advice, insightful feedback, and encouraging support. Their enthusiasm, patience, and friendly demeanor guided me whenever I felt lost. Their valuable suggestions and teaching have helped me complete my dissertation and equipped me with research methods and guiding principles that will benefit me throughout my life.

Secondly, I would like to thank Bansomdejchaopraya Rajabhat University and its faculty for providing an excellent learning environment. I have gained a deep appreciation for the Thai education system and the professionalism of university professors and scholars. Special thanks to the teachers of the Graduate School, the Confucius Institute, and the International Exchange Center for their meticulous and efficient work. Their sincere willingness to assist has dramatically supported my academic journey and life in Thailand.

Lastly, I am deeply grateful to the authors of all the references used in my study. I sincerely appreciate the experts who took time from their busy schedules to review this dissertation and provide valuable feedback.

Wen Yuli

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Chapter 1

Introduction

Rationale

Vocational education is crucial in connecting education with economic development in the context of rapid global economic changes driven by technological innovation and industrial transformation. The function of vocational education has gradually expanded from traditional labor skills training to promoting economic transformation and social sustainability (OECD, 2018). As an important model of vocational education, industry-education integration is a key strategy, emphasizing deep collaboration between the education system and industry sectors. Its core objective is to shorten the time gap between skills training and market demand through collaboration between schools and enterprises while enhancing education's capacity to support economic resilience and sustainable development (Busemeyer & Trampusch, 2012).

The Dual System of Vocational Education in Germany

Germany's dual vocational education system is a classic example of industry-education integration. Through collaboration between vocational schools and enterprises, students receive training that combines theory and practice during their schooling, progressively entering into practical work in enterprises. Schools and companies jointly develop the curriculum, with enterprises bearing a significant portion of the training costs. The German Vocational Education Act supports this model and enjoys widespread participation from companies. This system ensures the market suitability of student skills, and enterprises also benefit from it, making this system highly favored due to its significant economic benefits (BIBB, 2021). Statistics show that the employment rate of graduates under the dual system reaches 91%, with an 85% satisfaction rate among employers regarding graduates (Busemeyer & Trampusch, 2012). Data indicate that the unemployment rate of graduates in the

dual system is significantly lower than the EU average, and youth employment rates remain high over the long term (OECD, 2018).

The National Skills Framework in Australia

Australia has established the National Skills Framework to clarify vocational education's objectives and industry standards. This framework promotes collaboration between educational institutions and industry sectors to develop training programs, making curriculum design more flexible and responsive to regional labor market needs. Educational institutions design training programs in collaboration with enterprises based on framework requirements, and the industry-led training model enhances the market suitability of vocational education while promoting continuous updates of educational content (Wheelahan, Buchanan, & Yu, 2015). This model fosters lifelong learning and workforce suitability, which are significant for sustainable economic development.

Community Colleges and Business Collaboration in the United States

In the United States, community colleges provide customized vocational education pathways for students through flexible curriculum design and collaboration with local businesses. For example, Boeing collaborated with community colleges in the Seattle area to develop aerospace engineering technology courses, greatly enhancing graduates' employability (Perkins Act, 2018). This collaborative model utilizes federal funding and tax incentives to promote innovation and ensure talent supply for regional industries.

Japan's Industry-Education Integration Model

Japan's approach to industry-education integration focuses on "cooperative cultivation between schools and enterprises" and "lifelong vocational education," emphasizing collaboration among government, enterprises, and schools. Its characteristics include a high degree of enterprise leadership, policy support, and a flexible lifelong education system. The Japanese vocational education system combines theory and practice through cooperative education (similar to Germany's dual system) and collaboration between academia and industry. For instance, large manufacturing companies (such as Toyota and Honda) collaborate with vocational

schools to establish internal training centers that provide training from basic skills to advanced technologies (Amano, 2018). Japanese universities and vocational institutions work jointly with enterprises and research institutions to develop new technologies. For example, the Tokyo Institute of Technology collaborated with Panasonic to develop innovative manufacturing technologies, training many highly qualified personnel for the electronics industry (MEXT, 2021). However, Japan faces challenges such as uneven regional resource distribution and rapid technological updates, leading to the proposal of the "Future Vocational Education Reform Plan," strengthening deep cooperation between enterprises and schools while promoting the digital transformation of vocational education (OECD, 2018).

China's Industry-Education Integration Model

China's model of industry-education integration has developed rapidly in recent years, with policy-driven initiatives as its most significant feature. The Chinese government emphasizes the integration of "government, industry, academia, research, and application" in vocational education reform through the issuance of policies such as the "National Vocational Education Reform Implementation Plan" and the "Pilot Implementation Plan for Industry-Education Integration." China's industry-education integration is mainly realized through models such as industry colleges, modern apprenticeship systems, and regional pilot projects. For example, Huawei collaborates with vocational colleges in Guangdong to establish ICT colleges. CRRC Group collaborates with Changsha Vocational Technical College on modern apprenticeship projects, serving as national demonstrations (Ministry of Education, 2020). However, China also faces challenges such as insufficient enterprise participation, inadequate depth of cooperation, and regional development imbalances. Through introducing incentive policies and optimizing resource allocation, China continues to work on the depth and sustainable development of industry-education integration (Busemeyer & Trampusch, 2012).

The Importance of Economic and Industry-Education Integration in Guangdong Province

The integration of economy and education provides strong talent support for the high-quality development of Guangdong Province and promotes high-quality economic growth. First, through deep cooperation with enterprises, vocational colleges can adjust their professional offerings according to market demand, cultivating talents suited for emerging industries and transforming and upgrading traditional industries, thereby enhancing industrial competitiveness. For example, vocational colleges in Guangdong Province in fields such as artificial intelligence and digital economy have trained many professionals through collaboration with leading enterprises, significantly promoting the development of related industries (Guangdong Provincial Department of Education, 2021). Second, collaboration between enterprises and educational institutions facilitates knowledge and technology transfer flow, enhancing the region's innovative capacity and promoting innovation and technological advancement. Technology companies in Guangdong Province collaborate with universities to carry out research and development projects, promoting the application of new technologies and enhancing students' practical skills and innovative awareness. For instance, South China University of Technology collaborated with Gree Electric Appliances in Zhuhai to jointly develop innovative manufacturing technologies, providing important support for enhancing the competitiveness of enterprises (Lu, 2020).

As the economy rapidly develops, Guangdong Province faces challenges related to mismatches between skills supply and demand, and industry-education integration helps to alleviate these issues. Industry-education integration enables vocational colleges to flexibly train talents according to enterprise needs, ensuring that students possess market-relevant skills upon graduation. For example, Guangzhou Vocational Technical College adopts an order-based training model, targeting the manufacturing needs of the Pearl River Delta region, resulting in the cultivation of a large number of qualified technical workers (Guangdong Provincial Department of Education, 2021). Through collaboration with enterprises, vocational

colleges can provide students with real internships and practical opportunities, enhancing their vocational skills and employability. Many vocational colleges in Guangdong Province have established practical training bases in collaboration with local enterprises, allowing students to gain practical experience and better adapt to job requirements after graduation.

The integration of economy and education also positively contributes to social stability and harmony. First, it enhances the overall quality of society. By improving the quality of vocational education, the integration of economy and education helps more members of society acquire skills, thereby enhancing overall social quality. Vocational colleges in Guangdong Province actively implement vocational skills training programs, providing retraining opportunities for unemployed individuals and rural laborers, thereby facilitating reemployment (Guangdong Provincial Department of Human Resources and Social Security, 2020). Second, it promotes social equity. Industry-education integration provides equal vocational education opportunities for students from diverse backgrounds, helping narrow the gap between the rich and the poor. Guangdong Province has implemented various policies to improve the quality of vocational education in impoverished areas, enabling more students to receive quality education and change their destinies (Li, 2021).

Current Status of Industry-Education Integration in Vocational Colleges in Guangdong Province

As a significant economic development engine in China, Guangdong Province is at the forefront of promoting industry-education integration among vocational colleges nationwide. The Guangdong provincial government places high importance on developing vocational education and has implemented a series of policy documents to promote industry-education integration. For example, the "Implementation Plan for the Reform and Development of Vocational Education in Guangdong Province" (2019) emphasizes the need to deepen industry-education integration, encourage enterprise participation in vocational education, optimize the structure of vocational education, and closely align vocational education with local

economic development (Guangdong Provincial Department of Education, 2019). The "Implementation Plan for Industry-Education Integration in Guangdong Province" (2020) outlines the basic framework for school-enterprise cooperation, emphasizing the establishment of a collaborative mechanism among the government, schools, and enterprises to closely align vocational education with industrial development (Guangdong Provincial Department of Education, 2020). These policies lay the foundation for deep cooperation between vocational colleges and enterprises, providing financial and resource support.

In recent years, as industries undergo transformation and technological advancements, vocational colleges in Guangdong Province have actively explored new paths for industry-education integration through policy guidance, school-enterprise cooperation, curriculum reform, and practical teaching to meet the demands of economic and social development. Various industry-education integration models, including Order-Based Training, have been implemented in Guangdong's vocational colleges. This model involves signing talent cultivation contracts with enterprises to clarify training objectives and requirements. For example, Zhuhai City Vocational Technical College collaborates with Huawei to cultivate ICT talent specifically for Huawei and its partners. This model improves student employment rates and helps enterprises address talent shortages (Guangdong Provincial Department of Education, 2021). Modern Apprenticeship System: This model encourages enterprises to participate in the entire process of vocational education, allowing students to receive theoretical education from vocational schools while gaining practical experience within enterprises. The modern apprenticeship program implemented by Guangzhou Railway Vocational Technical College enables students to complete their practical training in railway industry enterprises, enhancing their employability. Co-construction of Training Bases: Vocational colleges and enterprises jointly build training bases to provide a more authentic working environment. For example, Guangdong Light Industry Vocational Technical College collaborates with multiple home appliance companies to establish

training bases, allowing students to learn in real production environments and improve their practical skills.

Although vocational colleges in Guangdong Province have progressed in industry-education integration, several prominent issues remain during policy implementation and practice. First, there is an insufficient dynamic matching between the education system and industry demands. There exists a time lag between the curriculum content of schools and the technological requirements of enterprises, resulting in a disconnection between talent cultivation and job requirements (World Bank, 2021). Second, enterprise participation is low: some enterprises, due to short-term profit considerations, lack the willingness and resource investment to participate in vocational education, limiting the depth and breadth of industry-education integration (Wheelahon, Buchanan, & Yu, 2015). Third, there is uneven resource allocation: significant disparities still exist in policy support and resource distribution between urban and rural areas, as well as among vocational colleges, which constrains the overall improvement of educational quality (OECD, 2018).

In conclusion, advancing vocational education requires fully integrating industry-education to enhance students' employability and suitability, promoting industrial development and social progress. By establishing close school-enterprise cooperation relationships and forming a deep industry-education integration, vocational colleges can better meet the talent demands of industries and provide educational training programs that closely align with market needs. Integrating industry-education allows teaching content to be closely linked with actual work, enhancing students' practical abilities and innovative capabilities. Furthermore, the government, vocational colleges, and enterprises must work together to establish a long-term stable cooperation mechanism to promote the in-depth development of industry-education integration.

Research Questions

1. What is the current status of industry-education integration in higher vocational colleges in Guangdong Province?
2. What are the strategies for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province?
3. Are the strategies for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province adaptable and feasible?

Research Objectives

1. To study the current status of industry-education integration in higher vocational colleges in Guangdong Province.
2. To formulate strategies for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.
3. To evaluate the suitability and feasibility of strategies for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.

Scope of the Research

Population and sample groups

population

There are 93 higher vocational colleges in Guangdong Province, with 1.254 million students and about 50,000 educational managers and teachers. The population of this study will select students and teachers from 5 representative higher vocational colleges in Guangdong Province for questionnaire survey and interview. In addition, the industry-education integration involves the participation of enterprises, so this study needs to select five senior managers of enterprises as interview subjects.

Sample Group

A. Collecting samples of questionnaires

According to the sampling table of Krejcie R.V. and Morgan D.W. (1970), the sample group of this study randomly selected 384 students and 361 teachers from 5 higher vocational colleges in Guangdong Province for the questionnaire survey. The students and teachers of these higher vocational colleges are more representative regarding industry-education integration. To ensure the representativeness of the sample group, this study will strive to ensure that the sample group reflects the characteristics of the entire population in terms of gender, age, grade, etc. In selecting the sample group, this study will follow scientific sampling principles such as randomness and representativeness to ensure the validity and credibility of the research results. At the same time, this study will respect each participant's rights and privacy to ensure the research's ethics.

Interviewer

This study selected seven educational managers from 5 higher vocational colleges and three senior corporate managers from 3 enterprises as Interviewer. Educational managers must meet the following conditions: 1) have worked in the school for more than 15 years; 2) be responsible for the school-enterprise cooperation, industry-education integration, and other specific work; 3) have the title of associate professor or above; 4) must be willing to participate in the structured interview recording; 5) must be willing to review the interview record for verification.

Senior corporate managers must meet the following requirements: 1) their company and higher vocational colleges are in school-enterprise cooperation; 2) have worked in the enterprise for more than 15 years; 3) senior corporate managers who participate in the formulation of corporate development policies; 4) must be willing to participate in the structured interview recording; 5) must be willing to review the interview record for verification.

B. Strategies developed by the strategy draft evaluation team

When developing strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province, experts

were used to evaluate the strategy draft and put forward reasonable and practical suggestions. This study selected 25 education administrators from 5 higher vocational colleges as strategy draft evaluation team members. Education administrators must meet the following conditions: 1) have worked in the school for more than 15 years; 2) be responsible for the school-enterprise cooperation, industry-education integration, and other specific work; 3) have the title of associate professor or above; 4) must be willing to participate in structured interview recordings; 5) must be willing to review the interview records for verification.

C. Sample of evaluation strategy

The five industry-education integration strategy evaluation experts are from Guangdong Light Industry Vocational and Technical College and Heyuan Vocational and Technical College. They greatly influence the strategic formulation, sustainable development, industry-education integration, talent training, and education management of higher vocational colleges. Qualifications of experts: 1) have worked in the school for more than 15 years; 2) be responsible for the school-enterprise cooperation, industry-education integration, and other specific work; 3) have the title of associate professor or above; 4) must be willing to participate in the structured interview recording; 5) must be willing to review the interview record for verification.

Variables

Independent variables

Countermeasures to strengthen the sustainable development of industry-education integration in higher vocational colleges. According to relevant theories and research analysis, the following aspects affect the sustainable development of industry-education integration in higher vocational colleges:

1. The influence of students on industry-education integration
2. The influence of higher vocational colleges on industry-education integration
3. The influence of enterprises on industry-education integration
4. The influence of the government on industry-education integration

Dependent variables:

Strategies for the sustainable development of industry-education integration in higher vocational colleges.

Contents

1. Study the current sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.
2. Formulation of strategies for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.
3. Evaluate the suitability and feasibility of strategies for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.

Research time

The research will be mainly conducted from February 2024 to February 2025, and the key stages are as follows:

1. In April 2024, complete the writing and review of the first three chapters and successfully defend them.
2. From May to June 2024, through questionnaire surveys and literature research, understand the current status of industry-education integration, school-enterprise cooperation, government policies, and professional curriculum settings in higher vocational colleges at home and abroad, and analyze the current problems and causes of industry-education integration.
3. From July to October 2024, research and formulate strategies for industry-education integration in higher vocational colleges and invite experts to evaluate their suitability and feasibility.
4. From November to December 2024, summarize the research results and publish papers in February 2025

Advantages

1. For the government, it can promote economic development. Industry-education integration can encourage scientific and technological innovation and economic development, improve enterprises' innovation abilities and core competitiveness, and promote regional economic upgrading and development.

2. For the Higher vocational colleges, it can improve the quality of education and teaching. Industry-education integration can blend education and industry, making the teaching content closer to actual needs, which can better cultivate high-quality talents that meet market demands.

3. For the enterprises, it can enhance industrial competitiveness for enterprises. Industry-education integration can improve the core competitiveness of upstream and downstream enterprises in the industrial chain, introduce high-quality talent, and provide customized technical services.

4. For the students, it can improve the employment rate for students. Through industry-education integration, students can quickly adapt to the enterprise's working environment and increase employment opportunities. At the same time, enterprises can better recruit suitable talent.

Definition of terms

Industry-Education Integration: Refers to the cooperation between industry (industry, enterprise) and education (mainly higher vocational schools) in jointly building majors, developing teaching staff, creating productive internship training bases, and cultivating talents together. It represents a superficial interest connection and win-win cooperation between schools and enterprises through industry-education integration to achieve mutual support and promotion between education and industry.

Strategy: Refers to setting objectives and formulating ways to achieve them. This article outlines four steps for formulating strategies: the first step is to clarify the objectives; the second step is to analyze the internal and external environment; the

third step is to develop clear strategies; and the fourth step is to evaluate and revise those strategies.

Sustainable Development of Vocational Education: Refers to the fact that higher vocational education adheres to a people-centered approach, follows the objective laws of educational development, correctly handles the relationship between the development of higher vocational education and economic and social development, builds a sustainable operation mechanism, reforms the talent training model, keeps higher vocational education vibrant, and cultivates higher vocational and technical talents with sustainable development capabilities, thereby promoting the harmonious development of society as a whole.

Higher Vocational Colleges: Refers to the Chinese higher vocational college system, which mainly includes vocational and technical colleges, colleges, universities, and schools that conduct higher vocational education. The higher vocational colleges in our study are the existing higher vocational colleges and vocational undergraduate colleges at the junior college level in China.

Research Tool: Refers to a method, technique, equipment, or software used to systematically collect, process, and analyze data in the process of scientific research. The design and use of research tools are intended to support researchers in answering research questions, verifying hypotheses, or exploring phenomena. Research tools can be quantitative, qualitative, or mixed methods, and their specific forms include but are not limited to questionnaires, interview guides, experimental equipment, statistical software, observation record sheets, literature analysis frameworks, etc.

SWOT Analysis: Refers to a strategic planning tool used to evaluate the internal strengths and weaknesses (Strengths and Weaknesses) and external opportunities and threats (Opportunities and Threats) of an organization, project, or individual. By systematically analyzing these four dimensions, SWOT analysis helps decision-makers develop effective strategies to maximize strengths, compensate for weaknesses, seize opportunities, and respond to potential threats.

SWOT-PEST Analysis: Refers to a comprehensive strategic analysis tool that combines the two methods of SWOT analysis (strengths, weaknesses, opportunities, threats) and PEST analysis (political, economic, social, and technological). By integrating the analysis of the internal and external environments, SWOT-PEST analysis can more comprehensively evaluate the macro-environment and internal conditions of an organization, project, or individual, thereby providing deeper insights and a broader perspective for formulating strategies.

TOWS Matrix: Refers to an extension tool of SWOT analysis, which is used to systematically match internal strengths and weaknesses with external opportunities and threats to generate specific strategic options. The TOWS Matrix helps organizations or individuals develop more targeted and actionable strategies by cross-analyzing internal and external factors. The name of the TOWS Matrix comes from the reverse order of SWOT, emphasizing the process of derivation of strategies from the inside to the outside.

Research Framework

To develop the framework for this study, the researchers introduced concepts and theories from the literature and research results related to the development concepts Research Framework.

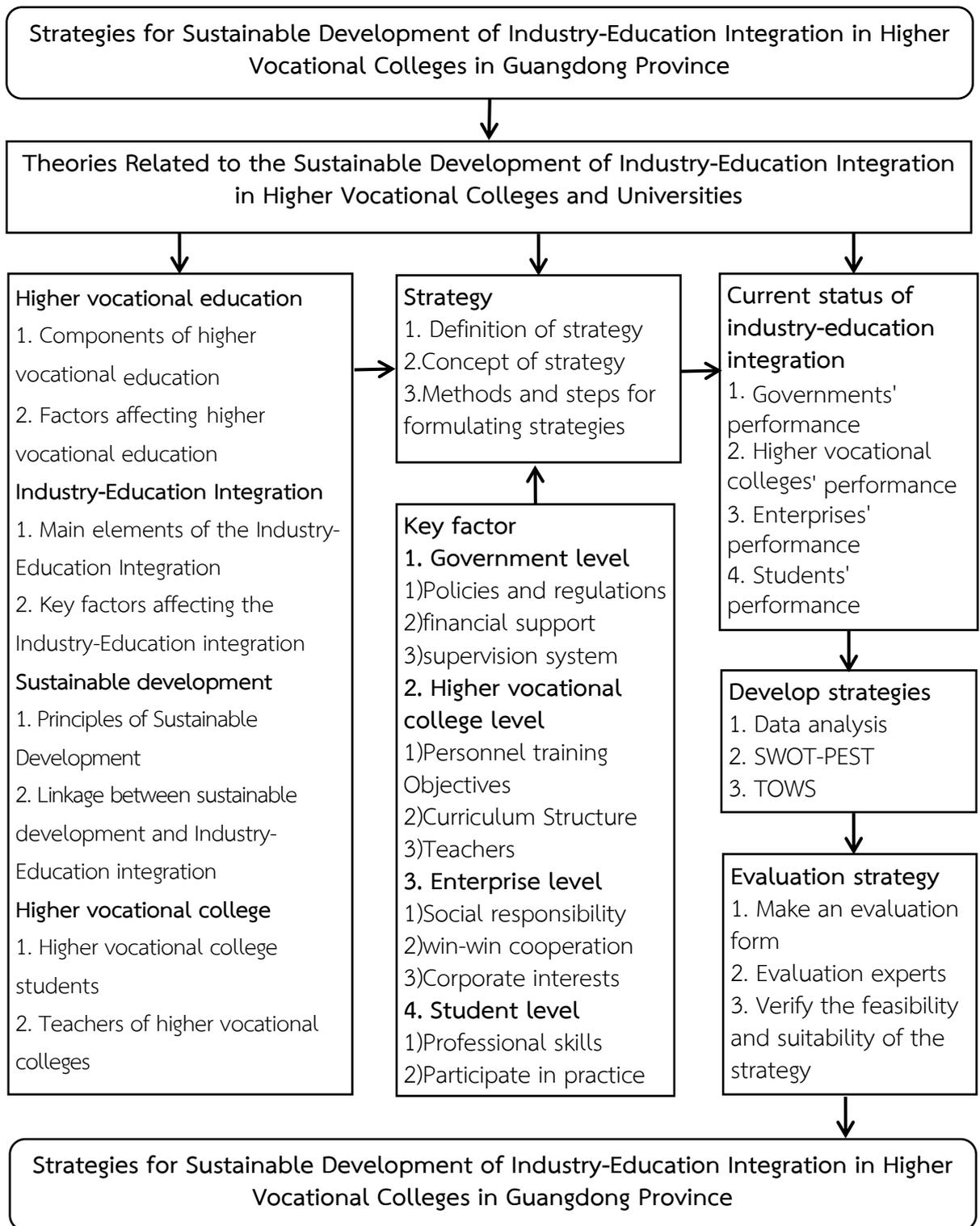


Figure 1.1 Research Framework

Chapter 2

Literature Review

This study reviews relevant scholars' theories and research results at home and abroad in school-enterprise cooperation, industry-education integration, etc. On this basis, the researchers analyzed the literature and related research results from the following aspects, as follows:

1. Industry-education integration
2. Strategy
3. Sustainable development of vocational education
4. Vocational colleges
5. Related Research

Details are as follows:

Industry-education integration

introduce

Industry-education integration mainly refers to the cooperation between industry (sectors, enterprises) and education (mainly higher vocational schools) in jointly building majors, building teaching staff, jointly building productive internship and training bases, and jointly cultivating talents. It is a superficial interest connection and win-win cooperation between schools and enterprises through industry-education integration to achieve mutual support and promotion between education and industry.

This study starts from the perspective of industry-education integration, searches for relevant literature, and understands the current status of theoretical research on industry-education integration, the definition of industry-education integration, the content of industry-education integration, the objectives of industry-education integration, the talent training model of industry-education integration, and the organization and system of industry-education integration. Details are as follows:

Analysis of the Current Status of Theoretical Research on Industry-Education Integration

The analysis of the current status of theoretical research on industry-education integration is based on data from China's largest online document download website (www.cnki.net). The search is conducted with the keyword "industry-education integration" to check the number of theoretical research documents on "industry-education integration" over the years to reflect the status of research on "industry-education integration." In 1995, the first research document on "industry-education integration" appeared on cnki; starting in 2012, the term "industry-education integration" appeared in policy documents, and scholars began to conduct research at this time gradually; in 2017, "industry-education integration" became an important national industrial policy and education policy. Therefore, from the perspective of the research process, 1995-2012 was a period of research silence, with only 72 papers published in 17 years. It entered an active period from 2013 to 2017, with 20,250 papers published in 5 years. It entered a prosperous period in 2018, and 133,259 papers were published from 2018 to 2023. The specific data is shown in the figure below:

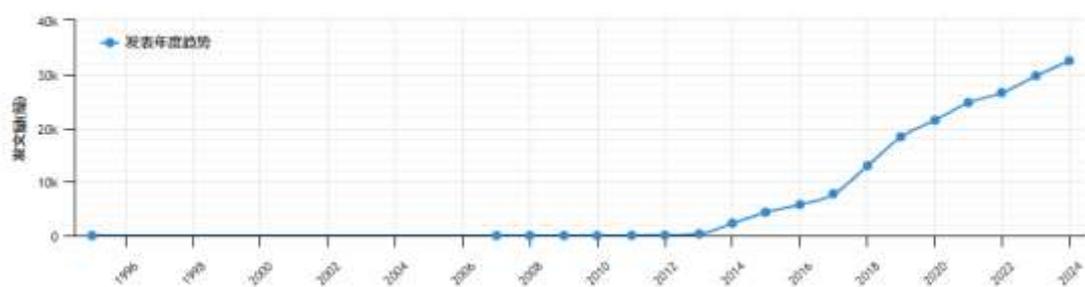


Figure 2.1 Trend of publication of papers on "industry-education integration" from 1995 to 2023

(Source: Wang Wanchuan, 221)

Table 2.1 Statistics of papers published on "industry-education integration" in recent years from 1995 to 2023

Time	Number of Published Papers	Stage
1995 - 2012	72	Silent period
2013 - 2017	20250	Active period
2018 - 2023	133259	Prosperity

Definition of Industry-Education Integration

As a professional definition, the concept of "industry-education integration" first appeared in the national policy text in the "Decision of the State Council on Vigorously Developing Vocational and Technical Education" in 1991, which "advocates the industry-education integration, and the integration of work and study." Industry-education integration has evolved from a series of related expressions, such as the integration of work and study, the integration of industry and study, and the industry-education integration. Researchers have considered and interpreted the essential connotation of industry-education integration from different perspectives.

Wang Wanchuan (2016) believed that the first official mention of industry-education integration was found in the "Opinions on Accelerating the Development of Rural Vocational Education" issued by the Ministry of Education and nine other departments in 2011. "Industry" refers to the industry, mainly including government, industry, enterprises, and other entities; "education" mainly refers to the education sector, including the management, implementation, and education of education; "integration" is a description and requirement for the relationship between the two, which should be able to integrate, cooperate, interact and achieve win-win results.

Hao Chun (2022) defines industry-education integration as taking industry enterprises as important subjects and industry departments as important participating units, closely connecting the direction of local industrial development with the direction of vocational education, and enterprises and vocational colleges carrying

out school-enterprise cooperation and collaborative education to jointly cultivate applied technical and skilled talents needed for regional economic and industrial development.

Wu Hong (2023) believes that industry-education integration refers to the cross-border cooperation between industry and education, sharing resources, co-construction, and sharing results between industry and education. Industry and education support and promote each other, and finally achieve a perfect combination of industry and education, which makes education an industry with super modern service functions integrating talent training, scientific research, and technological services, thus providing practical and effective services for the talent supply, talent training, and technological innovation of the industry.

Qiu Hui and Fan Qian (2016) believe that industry-education integration is a unified whole formed by the mutual coordination and interaction between the education and industrial systems. In a specific social field, the education system (including various types of colleges and universities) and the industrial system (enterprises and industry organizations) take their respective resource advantages as the starting point, win-win cooperation as the concept, cooperation contracts as the guarantee, serving industrial transformation and meeting economic development demands as the premise, talent training as the objective, project cooperation, technology development, and resource sharing as the carrier to achieve a comprehensive and in-depth integration of various elements within the industry and education system.

Chen Nianyou, Zhou Changqing, and Wu Zhuping (2014) proposed that industry-education integration refers specifically to the in-depth cooperation between vocational education and industry, that is, the in-depth cooperation and collaboration between various types of vocational colleges such as secondary vocational colleges, higher vocational colleges, and undergraduate vocational colleges and enterprises and industries to improve the quality of vocational talent training.

Chen Feng (2018) believes that industry-education integration is not limited to the diversified organizational forms of industry-education integration within industry-education but can create an industry-education integration innovation ecosystem dominated by innovation and centered on technological change. Even if there are different definitions of industry-education integration, its connotation cannot be separated from the two development fields of education and industry.

Until now, academia has no authoritative and unified conclusion about the definition of industry-education integration. From a macro perspective, industry-education integration is the industry-education integration, and from a micro perspective, it is the integration of production and teaching. Therefore, most scholars directly define industry-education integration according to their research needs. The industry-education integration in this article mainly refers to the cooperation between industry (industry, enterprise) and education (mainly higher vocational schools) in jointly building majors, building teaching staff, jointly building productive internship and training bases, and jointly cultivating talents. It is a superficial docking of interests and win-win cooperation between schools and enterprises through industry-education integration to achieve mutual support and promotion between education and industry.

Contents of Industry-Education Integration

Wang Lan (2015) believes that from the perspective of integration content, the integration of "production" and "education" is the mutual promotion of the overall development of education and its industrial structure and scale development, which enables higher vocational colleges to better adapt to the industrial development needs of the region in terms of professional settings; at the micro level, the integration of "production" and "education" involves the collaborative education of higher vocational colleges and enterprises, which is a compelling connection between production activities and talent training models.

Liao Huiqin (2017) believes that industry-education integration is the cooperation between schools and enterprises and narrowly defines the subjects of industry and education as "enterprises" and "schools." She believes that "the industry-

education integration refers to the integration of production and teaching in the process of educating people, including two aspects: one is the integration of the educational and teaching process with the production work process, which is the integration of the educational method; the other is the integration of the educational and teaching content with the production technology and skills, which is the integration of the educational content.

Wang Zhongxiao (2019) believes that in the industry-education integration implemented by higher vocational colleges, more emphasis is placed on the concept of adapting the layout of higher vocational education resources and the level and type of talent training to the needs of industrial development. It is a significant structural adjustment to economic and social development. Its purpose is to, on the one hand, solve the current shortage of skilled talents and, on the other hand, fundamentally solve the employment problem of graduates from higher vocational colleges.

Hua Yarong (2022) believes that industry-education integration is a talent training model that closely integrates the industrial and vocational education systems. Generally speaking, the content of industry-education integration is an organic whole formed by the integration of the industrial system and the education system. Specifically, the content of industry-education integration is that the education department (mainly colleges and universities) and the industrial department (industry, enterprise) entirely rely on their respective advantageous resources and advantages within the society, based on mutual trust and contracts, serving economic transformation and meeting needs as the starting point, with collaborative education as the core, win-win cooperation as the driving force, school-enterprise cooperation as the main line, project cooperation, technology transfer and joint development as the carrier, and cultural integration as the support. It is an economic education activity mode in which all participating subjects cooperate, with the optimal combination and high integration of various elements within and between industries and education.

Zhou Weijie (2021) believes that the content of industry-education integration can be understood from three levels, reflecting the interactive relationship between higher vocational education and social development. First, at the macro level, the overall development of higher vocational education should be combined with the industrial development and overall strategic planning of the national and regional economic society, forming a mutually coordinated and mutually reinforcing relationship between higher vocational education and industrial development; second, at the meso level, schools, education and training institutions, etc. should form a mutually dependent relationship with relevant economic departments and industries; third, at the micro level, the school's professional settings, course content, teaching process, etc. are connected with the job requirements, occupational standards, production processes, etc. of industry enterprises, forming a mutually connected relationship.

In summary, although the industry-education integration is based on school-enterprise cooperation and the combination of work and study, its extension is broader, and the subjects of education participation are more diversified. Therefore, the deep-level content of the industry-education integration is to achieve the overall planning of vocational education and regional economy, the complementary advantages of education and industry departments in talents, technology, and resources, and the integration of teaching with the whole process of industrial production, service, and operation.

The objective of industry-education integration

Fang Yiquan, Huang Yunbi, and Guo Liying (2020) believe that improving the quality of talent training is the fundamental objective of industry-education integration. Industry-education integration is an educational activity that explores individual values and realizes talent growth. It aims to develop a diversified, personalized, distinctive talent training model and cultivate compound talents with strong suitability, innovation, and entrepreneurship capabilities.

Li Mengqing and Li Xin (2020) believe that the positioning of industry-education integration should focus on economic and industrial development needs. The core of industry-education integration is to follow the laws of education and school development to meet the needs of economic and social development, connect with the needs of local industrial structure adjustment, optimize the supply and demand structure of talent training, and give play to the overall ecological effectiveness of industry-education integration.

Cai Wenbo and Tian Lu (2022) believe that the objective of industry-education integration is to promote the development of vocational education itself. Deepening the industry-education integration and building a community of shared destiny between schools and enterprises are necessary to accelerate the construction of a modern vocational education system and promote the connotation-oriented development of vocational education. They must insist on using industry-education integration to promote the high-quality development of modern vocational education.

Bai Yixian and Wang Hua (2022) believe that the main objective of industry-education integration is to achieve "five connections": first, optimize the professional settings to achieve the connection between professional settings and industry needs; second, design the curriculum system and teaching content according to the industry's technological level and professional qualification standards to achieve the connection between curriculum content and professional standards; third, simultaneously deepen cultural, technical and skills learning and training to achieve the connection between the teaching process and the production process; fourth, incorporate professional qualification standards and industry technical specifications into the curriculum system to achieve the connection between graduation certificates and professional qualification certificates; fifth, establish an open mechanism for the vocational education system to achieve the connection between vocational education and lifelong learning.

Talent training model integrating industry and education

The talent training model of industry-education integration in higher vocational education refers to one or more standard styles for reference in the entire process and integrated development of industry, industry enterprises, and higher vocational education in education, teaching, scientific research, etc. Since industry-education integration involves a wide range of aspects, research on the industry-education integration model of higher vocational education includes multiple levels, and many scholars have conducted in-depth studies on it based on different starting points. Regarding the types of industry-education integration models, foreign scholars have conducted extensive theoretical and empirical research on the talent training model of industry-education integration in higher vocational colleges. In contrast, domestic research mainly focuses on qualitative analysis.

Klingstrom (1987) believed that the talent training model of industry-education integration refers to how teaching content and enterprise production are integrated and collaboratively educates individuals. It has the characteristics of combining work and study, two-way participation, and serving society.

D'Este and Patel (2007) found that joint research, consulting, contract research, patent licensing, training, and spin-off companies are the mainstream models of industry-education integration.

Wright et al. (2008) divided the industry-education integration model into the joint R&D model (technology is at the invention stage), the commissioned development model (technology is at the marketization stage), and the consulting research model (technology is at the diffusion stage) according to the stage of technology.

Johnsen et al. (2015) believed that the quality of the industry-education integration talent training model in higher vocational colleges is closely related to the stakeholders.

Wang Danzhong (2014) proposed six models based on the carrier form: "enterprise + school," "industry + school," "industry + enterprise + school,"

"government + school," "government + enterprise + school" and "government + industry + enterprise + school."

Liu Lian and Zhao Kai (2020) proposed typical models of industry-education integration, such as technical cooperation, scientific and technological research projects, modern apprenticeships, vocational education groups, co-construction of training bases, and co-construction of secondary colleges.

Jiang Xinge (2020) proposed the construction path of industrial colleges. Industrial colleges have a diversified property rights structure of schools and enterprises, a dual organizational nature of educational institutions and corporate characteristics, a dual value orientation of educational public welfare and corporate economic benefits, and a dual-track operation mechanism of administrative management and market management.

Wang Lingling (2015) proposed that higher vocational colleges should cooperate with enterprises to establish related industry-school models, such as higher vocational colleges plus science and technology parks, higher vocational colleges plus school-run enterprises, and higher vocational colleges plus industrial alliances. This is the research on the talent training model of higher vocational colleges integrating industry and education. The research on talent training models mainly focuses on the degree of fit between majors and industries, the level of "dual-qualified" teachers, and the quality of talent training.

Chai Meijuan (2020) proposed a "five-in-one" modern apprenticeship talent training program with dual mentors from enterprise masters, dual identities as students and employees, dual tasks of study and work, dual evaluates from schools and enterprises, and dual incentives of credits and work allowances.

Xiao Ronghui and Tian Jin (2020) believed that from the perspective of government-school-enterprise collaboration, higher vocational colleges face many problems, such as the mismatch between professional settings and regional economic and industrial development needs and the lack of construction of "dual-qualified" teaching staff. They proposed strengthening the construction of

professional groups and establishing a composite teaching team of "industry + enterprise + university."

Chang Xiaoyu (2019) discussed the difficulties faced by the innovation and entrepreneurship teaching reform in higher vocational colleges regarding curriculum setting, support and guarantee, and faculty strength and proposed corresponding countermeasures based on the perspective of industry-education integration. It is necessary to build a multi-level teaching model, create a diversified curriculum system, build a complete education practice platform, and increase the number of "dual-qualified" teachers.

According to the research results of scholars, we can roughly summarize the education integration model into four types: industry-education integration R&D model, industry-education integration co-construction model, project-driven model, and talent training exchange model. Although these four models reflect the path of integration between local universities and enterprises from different perspectives, they are not in conflict. They should be mutually influential and mutually reinforcing. Although many cooperation models exist for industry-education integration, most are led by higher vocational colleges and cooperate with enterprises. Some participate in industry associations or enterprise alliances.

Table 2.2 Summary of Industry-Education Integration Models and Paths

Model	Main body	Features	Method Path
Industry-education integration R&D model	Enterprises, universities, Research center	technology R & D Complementary advantages	Conduct experience exchange meetings, provide technical exchanges and technology transfers, and participate in joint development projects.
Industry- education integration co-construction model	Enterprises, universities, government	Government-led Jointly build economic entities	Jointly build laboratories, R&D centers, physical enterprises, Talent training base, etc.
Project traction model	Enterprises, universities, government	Project Lead Low competitive advantage	Jointly apply for national or local key projects and can also undertake Projects carried out by enterprises
Talent training model	Enterprises, universities	Dual sports person Resource Sharing	Teachers and students practice in enterprises, and enterprise staff practice in schools. Teaching

Organization and system of industry-education integration

Regarding the organization and system of industry-education integration, scholars mainly research the participants, operating mechanism, organizational form, and institutional environment.

Li Jin (2016) pointed out from the perspective of public governance that industry-education integration has formed a development pattern of "government macro-coordination, enterprises, and schools as the main body, and coordinated promotion by the government, enterprises, schools, industries, and society," realizing the all-around integration of structural elements on the supply side of talent training and the demand side of the industry.

Dong Gang (2019) believes that in industry-education integration, it is necessary to implement government functions and establish a working mechanism; schools should take the lead and implement the concept of industry-education integration in all aspects, strengthen the construction of industry organizations, and fully play the industry's guiding role.

Zhang Jian (2020) proposed the multi-subject governance of industry-education integration, in which the government is the key subject, the industry is the guiding subject, the school is the fundamental subject, and the enterprise is the substantive subject.

Xie Weihe (2022) analyzed the policies and measures for industry-education integration in vocational education and pointed out that the government's status and role in industry-education integration have changed from "leading" in the past to "promoting" and requiring vocational schools to run more according to market guidance.

Yang Po (2022) believes that the core issue of improving school-enterprise cooperation lies in bringing the government back into the framework. When the government introduces policies to promote industry-education integration, it should encourage enterprises to participate while also paying attention to the type of school-enterprise cooperation, cost sharing, skill formation, and the type of skills.

Liu Jun (2018) believes that industry-education integration in China has formed diversified organizational forms such as industrial colleges, vocational education groups, industry-education integration parks, factories in factories, schools in factories, smart learning workshops, teacher studios, and industry-education integration enterprises. The future integrated industry-education integration organizational form will be more of an industrial college for schools and an industry-education integration enterprise for enterprises.

Sun Weiping and Wang Ronghui (2008) analyzed the organizational system of industry-education integration from the meso-level. They proposed that vocational colleges integrate resources from enterprises, industries, research institutes, industrial parks, governments, etc., rely on school-enterprise alliances and industrial colleges, and build a three-in-one industry-education integration system of "vocational education group-school-enterprise alliance-industrial college."

Wang Qiuyu (2017) analyzed the connotation of the industry-education integration operation mechanism, that is, the school closely follows the local advantageous and characteristic industries, actively carries out in-depth cooperation with relevant enterprises, and the government participates and supports to achieve a scientific and efficient operation mechanism for win-win development of the three parties.

Li Mengqing and Xing Xiao (2020) proposed that the operating mechanism of industry-education integration lies in building an ecological cycle that connects professional chains with industrial chains, curriculum content with professional standards, and teaching processes with production processes.

In summary, the subjects of industry-education integration include not only schools and enterprises but also governments and industry organizations. Therefore, for the organization of industry-education integration, local governments should actively support enterprises as important subjects to participate in the operation of vocational colleges, encourage enterprises to participate in multiple factors, and expand from the past capital factor to capital, technology, equipment, management and other factors, strengthen the supply of factors for enterprises to participate in

the operation of vocational colleges, clarify the rights of enterprises to run schools, and innovate the system and mechanism for enterprises to participate in the operation of vocational colleges. Moreover, the efficient operation of industry-education integration depends on resource sharing, docking coordination, and organizational guarantees among subjects. In short, the organizational form of industry-education integration has cross-subject characteristics and realizes value co-creation by integrating organizational resources and organizational culture.

Factors Influencing the Sustainable Development of Industry-Education Integration

The sustainable development of industry-education integration is a comprehensive process that involves the active participation of various stakeholders, including governments, enterprises, higher vocational institutions, and students. The following is an in-depth analysis of the influencing factors at four levels, integrating the views of multiple researchers.

1. Government-Level Factors

Governments are central in establishing the foundation and framework for sustainable industry-education integration. Several dimensions emerge from the literature:

Policy Frameworks

A well-structured policy environment provides the legal and regulatory basis for collaboration.

The OECD (2018) highlights the importance of comprehensive national strategies that align vocational education with labor market demands.

The Perkins Act (2018) in the U.S. is a policy model for linking funding to performance-based outcomes in vocational education programs, encouraging collaboration between educational institutions and industries.

The Ministry of Education (2020) has issued guidelines for modern apprenticeship programs in China, emphasizing policy coherence to support long-term collaboration.

Financial Incentives

Governments incentivize stakeholders to participate in vocational education through funding and subsidies.

World Bank (2021) stresses that grants and tax benefits for enterprises actively engaging in training programs enhance their willingness to collaborate with educational institutions.

BIBB (2021) demonstrates how Germany's dual system benefits from sustained public funding, ensuring equitable resource distribution across schools and industries.

Coordination and Oversight Mechanisms

Governments also facilitate coordination among stakeholders and monitor the outcomes of integration efforts.

Müller and Gangl (2019) argue that government-driven oversight mechanisms improve the accountability of enterprises and schools, ensuring mutual benefits.

Zhang and Wang (2020) emphasize the role of local governments in coordinating regional educational institutions and industries to address specific labor market needs.

2. Enterprise-Level Factors

Enterprises are vital contributors to the practical implementation of industry-education integration. The following aspects are crucial:

Active Collaboration with Educational Institutions

Enterprises can work closely with institutions to align training with industry requirements.

Yang (2021) and Zhang and Wang (2020) point out that co-developing curricula and providing practical training opportunities enhance student employability and bridge the skills gap.

Shen (2020) observes that Chinese enterprises participating in school-enterprise partnerships foster closer alignment between academic instruction and industrial needs.

Investment in Training and Resources

Enterprises' financial and material investments ensure the sustainability of integration programs.

Liu and Zhao (2020) highlight that resource allocation, including specialized equipment and internships funding, significantly impacts training quality.

Amano (2018) provides insights from Japan, where enterprises co-fund vocational training programs to secure a skilled workforce.

Innovation and Long-Term Engagement

Enterprise's commitment to long-term collaboration facilitates innovation in teaching and learning.

Müller and Gangl (2019) describe how enterprises involved in Europe's dual education systems continuously innovate training programs to adapt to market changes.

Qin et al. (2018) stress the importance of developing shared value systems between schools and enterprises to ensure the longevity of these partnerships.

3. Higher Vocational Institution-Level Factors

Higher vocational institutions are central to operationalizing industry-education integration. Key dimensions include:

Curriculum Development

Institutions must develop industry-relevant curricula to meet evolving market demands.

Lu and Wei (2015) and Mao et al. (2020) argue that including emerging technologies and practical skills in curricula enhances students' employability.

Chen (2023) highlights the importance of dynamic curricula that evolve based on feedback from industries and alumni.

Teacher Professionalization

Skilled and experienced teachers are crucial in bridging theoretical and practical knowledge.

Zhao and Suo (2014) recommend continuous professional development so that teachers stay updated with industrial practices.

Xu et al. (2023) emphasize that teacher exchanges with enterprises help bring real-world insights into classrooms.

Institutional Support and Infrastructure

Dedicated administrative structures ensure effective collaboration between institutions and enterprises.

Jin et al. (2012) suggest that specialized offices or departments for managing school-enterprise partnerships streamline processes and improve accountability.

He (2023) observes that institutions with robust support systems are better positioned to maintain long-term partnerships.

4. Student-Level Factors

Students are the ultimate beneficiaries and participants in industry-education integration. Their active engagement is essential for sustainable outcomes.

Engagement in Practical Learning

Hands-on learning opportunities are critical for skill development.

Barnett (2023) emphasizes the importance of internships and apprenticeships in developing practical competencies.

Mao et al. (2020) highlight that students engaged in real-world projects acquire skills that improve their employability.

Intrinsic Motivation and Career Planning

Students' motivation and career aspirations directly influence the effectiveness of integration programs.

Zhang and Deng (2023) suggest that mentorship programs can help align students' objectives with industry demands.

Wang and Zhang (2023) note that career counseling services offered by institutions significantly improve student participation and satisfaction.

Skill Acquisition and Innovation

Students must develop technical and soft skills to succeed in the labor market.

Qin et al. (2018) stress that industry-focused training programs foster creativity and suitability among students.

Xu et al. (2023) argue that combining technical skills and teamwork abilities prepares students for dynamic work environments.

Shared Perspectives Across Studies. The table below summarizes the overlapping perspectives among researchers on the factors influencing the sustainable development of industry-education integration:

Table 2.3 The Sustainable Development of industry-education Integration Common Perspective

Author	Government	Enterprise	Vocational colleges	Student
Perkins Act. (2018)	√	√		
OECD. (2018)	√			
Ministry of Education. (2020)	√			
World Bank. (2021)	√			
BIBB. (2021)	√			
Müller & Gangl. (2019)	√	√		
Yang. (2021)		√		
Zhang & Wang. (2020)	√	√		
Liu & Zhao. (2020)		√		
Amano. (2018)		√		
Lu & Wei. (2015)			√	
Mao et al. (2020)			√	√
Zhao & Suo. (2014)			√	
Barnett. (2023)				√
Qin et al. (2018)		√		√
Xu et al. (2023)			√	√

Strategy

introduce

Strategy is setting objectives and developing ways to achieve them. This article outlines four steps to formulating a strategy: the first step is clarifying the objectives; the second step is analyzing the internal and external environment; the third step is formulating a clear strategy; and the fourth step is evaluating and modifying the strategy.

To be familiar with the definition of strategy, the theory of strategy, the key factors affecting strategy formulation, and the methods and steps of strategy formulation. Many scholars have conducted research from different aspects. The details are as follows:

Definition of Strategy

The word "strategy" comes from the Greek word (Strategos), which means "The Art of General," that is, the way to use troops. Therefore, strategy can be interpreted as tactics, strategies, and policies. This is a broad and complex concept, and its definition covers many fields, such as management, politics, military, and business. Later, the word "strategy" was introduced into management science, and its main definitions are as follows.

Alfred D. Chandler (1962) defines strategy as the design of an organization's long-term objectives and decisions and the actions and assets allocated to achieve those objectives.

WF Glueck (1980) believes that strategy is a unified, coordinated, comprehensive, and integrated plan to achieve an organization's basic objectives.

Ohmae Kenichi (1981) proposed that the only objective of strategic planning is to enable the design organization to gain more advantages than its competitors as efficiently as possible. Therefore, strategy means trying to change the organization's power most efficiently and using this power to outperform competitors. The Stanford Strategic Research Center believes the strategy is a means to pursue objectives. This means it reflects the changes in the design organization's environment, the use of major resources, and the guidance of the design organization's development direction.

Kenny Andersen defines strategy as follows: Strategy is the form of objectives and the major policies and plans for achieving them, determining the business an organization is to undertake and the category to which the organization should belong.

Henry Mintzberg (1987) proposed the "5P" model for designing organizations: Plan, Ploy, Pattern, Position, and Perspective. These five models explain the concept of organizational design strategy from different perspectives: First, strategy is a plan. Strategy is a purposeful, expected, and organized action procedure. As a plan, the strategy should indicate the direction and path of development, including a series of policies and guidelines for dealing with a certain situation, which belongs to "planning before action." Second, strategy is a tactic. Strategy can be a means and tactic in the process of action. Different measures are taken to achieve strategic objectives according to the environment and the situation of competitors. It is a tool to defeat opponents in competitive games. Third, strategy is a pattern. Strategy can be reflected in the procedures and norms followed by organizational behavior. The entire strategy is regarded as a movement process of "behavior flow." The two definitions of strategy as a plan or a pattern are independent. In practice, plans are often not implemented, while patterns may be formed without prior planning. Therefore, a strategy positioned as a "plan" is a designed strategy, while a strategy defined as a "pattern" is an implemented strategy. Fourth, strategy is a kind of positioning. Strategy is an organization's judgment of the unknown in its environment. To regard strategy as a kind of positioning is to form effective competitiveness through correct resource allocation. Finally, strategy is a concept. Strategy expresses the organization's inherent way of cognition of objective time and reflects the value orientation of the enterprise. Strategy is a definition of a concept, emphasizing the abstractness of strategy. Its essence lies in the fact that, just as the spiritual contents, such as values, culture, and ideals, are shared by the organization's members, the strategic concept must be shared through the expectations and behaviors of the members. In summary, strategy is to set objectives and formulate ways to achieve them.

Theory of Strategy

There are many kinds of strategic theories, including resource-based theories, core capability theories, and dynamic capability theories.

Wernerfelt (1984) proposed the resource-based theory, which holds that enterprises are a collection of various resources and that enterprise growth results from the overall planning and coordination of the resources and management functions owned by the enterprise. This theory has a new understanding of enterprise growth, believing that the driving force of enterprise growth is the use of its production resources to form production services and that the unique power of the enterprise drives enterprise growth as an individual (usually the services or capabilities generated by the enterprise's mobilization of its resources), rather than the equilibrium power of the market. The resource-based theory establishes an analytical framework of "enterprise resources-enterprise capabilities-enterprise growth." The resource-based theory first assumes that the resources of enterprises are heterogeneous and there are differences in the resources owned by different enterprises. Even two enterprises in the same industry will accumulate different resources due to differences in their resources and capabilities when they are first established, the development process, and the judgment of the future during the operation process.

CK Prahalad and Gary Hamel (1994) proposed the core competence theory. An enterprise's core competence is a unique capability formed in its long-term business activities that is difficult for competitors to imitate. This capability can bring the enterprise competitive advantages and sustainable development. Forming core competence requires continuous accumulation, updating, and strengthening of enterprises and constantly pursuing excellence in innovation and development.

David J. Teece (1992) proposed the theory of dynamic capabilities, which mainly examines how enterprises can integrate, build, and reconfigure internal and external resources and capabilities to generate new capabilities to adapt to rapidly changing environments. The theory assumes that enterprises with high dynamic capabilities have more advantages than those with low dynamic capabilities. The

purpose of this theory is to explain how enterprises use dynamic capabilities to create and maintain competitive advantages over other enterprises in responding to and creating the environment.

In short, different strategic theories have applicable scenarios and conditions, and choosing the appropriate strategy or applying it comprehensively based on one's actual situation is necessary.

Methods of Strategy Formulation

Johnson G. and Scholes K (1999) proposed the PEST analysis method, which is a method used by strategic consultants to help companies review their external macro environment. It refers to the analysis of the macro environment, the general environment, and the various macro forces that affect all industries and companies. When analyzing macro-environmental factors, different industries and companies will have different specific contents based on their characteristics and business needs. However, generally, they should analyze the four major external environmental factors that affect the company: political, economic, social, and technological.

Heinz Wehrlic (1982) proposed the SWOT analysis method, which can objectively and accurately analyze and study the actual situation of a unit. The four letters of SWOT stand for Strength, Weakness, Opportunity, and Threat. SWOT can be divided into two parts: the first part is SW, which is mainly used to analyze internal conditions; the second part is OT, which is mainly used to analyze external conditions. The various factors obtained from the survey are sorted according to the order of importance or degree of influence to construct a SWOT matrix. After completing the environmental factor analysis and the construction of the SWOT matrix, a corresponding action plan can be formulated. The basic idea of formulating a strategy is to give play to the advantages, overcome the weaknesses, use the opportunities, and resolve the threats; consider the past, base on the present, and look to the future. Using the comprehensive system analysis method, the various environmental factors arranged and considered are matched and combined to obtain a series of options for the company's future development.

Heinz Weirick (1982), a professor of management at the University of San Francisco, proposed TOWS (also known as the Dawes matrix), a situation analysis method. The four letters of TOWS stand for Strength, Weakness, Opportunity, and Threat. It is often used in corporate strategy formulation, competitor analysis, and other occasions. TOWS analysis is also called reverse SWOT analysis. Its analysis order is exactly the opposite of SWOT analysis. First, the market opportunities and dangers are analyzed, and then the strengths and weaknesses of the enterprise are analyzed. SWOT analysis first analyzes oneself, focusing on the strengths and weaknesses of the enterprise, and then analyzes whether there are opportunities or dangers in the market. When people formulate competitive strategies, they often look at the market first, not themselves, so it is often more practical to first confirm the market opportunities and then judge whether the enterprise can seize the opportunities and avoid the threats in the market based on the advantages of the enterprise.

SO strategy: Companies can leverage their strengths to maximize external opportunities and adopt an offensive strategy. WO strategy: Companies can specifically make up for a certain disadvantage by seizing external opportunities and adopting a reversal or innovation strategy. ST strategy: Companies meet challenges with their strengths, take the initiative to use their strengths to deal with external threats, and adopt an active defensive strategy. WT strategy: The threats faced by companies are precisely their weaknesses. For this kind of "misfortunes never come singly," companies should adopt a more conservative defensive strategy, making up for their shortcomings while seeking solutions to external threats. This is a very good strategic management tool. First, use SWOT analysis, and then use TOWS to implement it.

The current strategy formulation methods mainly include PEST analysis, SWOT analysis, and TOWS analysis. PEST focuses on external environment analysis, including the four major elements of politics, economy, society, and technology; SWOT focuses on internal environment analysis, including opportunities, threats, strengths, and weaknesses; the results of SWOT analysis are converted into action plans. This conversion tool, the TOWS analysis method, combines strengths,

weaknesses, opportunities, and threats in pairs to obtain four situations and then gives corresponding strategic countermeasures based on these four situations. This paper will use the PEST analysis method to analyze the external environmental factors that affect the sustainable development of industry-education integration in higher vocational colleges, analyze the internal environment that affects the sustainable development of industry-education integration in higher vocational colleges through SWOT analysis, and find out the strategies for the sustainable development of industry-education integration in higher vocational colleges through TOWS analysis.

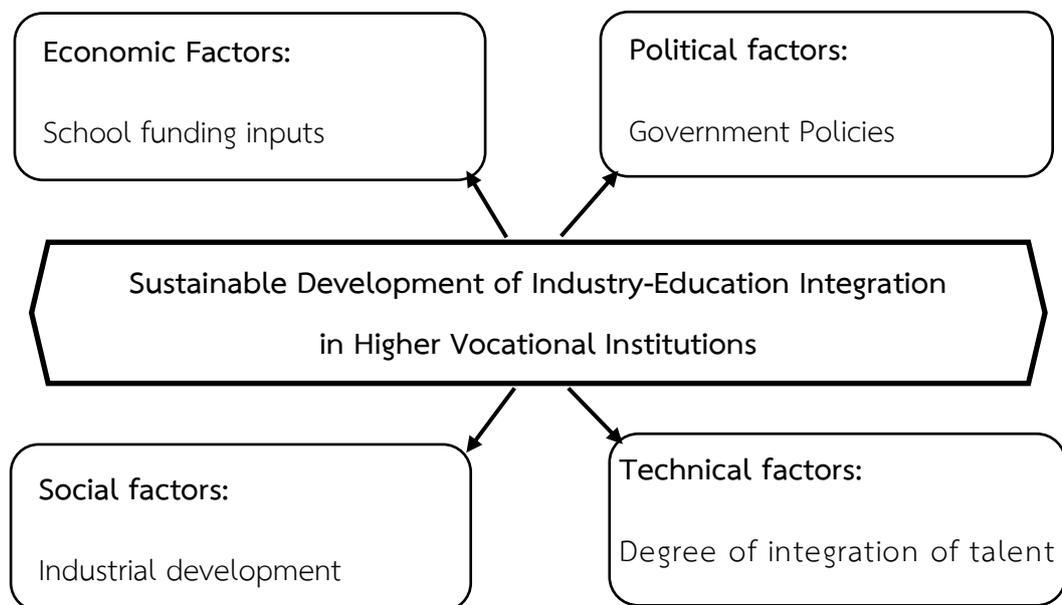


Figure 2.2 Analysis of the industry-education integration in higher vocational colleges using the PEST analysis method

(Source: Heinz Weirick, 231)

Political Factors: This article mainly refers to the impact of the country's social system, the nature of the ruling party, and the government's guidelines, policies, and laws on the sustainable development of industry-education integration in higher vocational colleges.

Economic Factors: School capital investment mainly refers to special funds used by higher vocational colleges to carry out activities conducive to talent training, scientific research and development, industry-education integration, and school-enterprise cooperation, which promotes the sustainable development of industry-education integration.

Enterprise capital investment mainly refers to funds enterprises invest in cooperation with higher vocational colleges to upgrade industrial production, conduct product research and development, and increase profits.

Sociocultural Factors: This article's social factors mainly refer to whether the development of the entire industry is stable, healthy, and sustainable.

Technological Factors: This article's technical factors mainly refer to whether the talent training programs of higher vocational colleges are consistent with enterprises' talent needs.

Through the PEST analysis method, we know that the external environmental factors that affect the sustainable development of industry-education integration in higher vocational colleges include government policies and school policies, school capital investment, enterprise capital investment, industrial development status, and the degree of integration between talent training and industry.

Table 2.4 SWOT analysis of the industry-education integration in higher vocational colleges

S(Strengths)	W (Weaknesses)
1. Accurate school positioning	1. The vocational education system is not sound
2. Unique professional settings	2. There are too many forms of industry-education integration
3. Social services and training	3. The integration of industry, education, and research is not deep enough
4. Emphasis on the industry-education integration	
5. Teacher team building and incentives	

Table 2.4 (Continued)

O(Opportunities)	T (Threats)
1. Opportunities brought by the introduction of relevant national policies	1. Policies and regulations are slightly lagging behind
2. Local government attention	2. The effectiveness of industry-
3. Promotion of the construction of higher vocational colleges	education integration is not high
4. Opportunities brought by regional economic development	

Through SWOT analysis, we know that the internal environmental factors that affect the sustainable development of industry-education integration in higher vocational colleges are mainly the clear positioning of higher vocational colleges and their high attention to industry-education integration, strong support from the government, mismatch between the talent training methods of higher vocational colleges and industry needs, and lagging policies and regulations.

Table 2.5 Using the TOWS analysis method for the industry-education integration in higher vocational colleges

				Internal factors	
		S (Strengths)			W (Weaknesses)
		1. Accurate school positioning			1. The vocational education system is not sound
		2. Unique professional settings			2. There are too many forms of industry-education integration
		3. Social services and training			3. The integration of industry, education, and research is not deep enough
		4. Emphasis on the industry-education integration			
		5. Teacher team building and incentives			
External factors	O(Opportunities)	SO strategy (growth) :		WO strategy (reversal type) :	
	1. Opportunities brought by the introduction of relevant national policies	Develop strengths and seize opportunities		Take advantage of opportunities and make up for weaknesses	
	2. Local government attention				
	3. Promotion of the construction of higher vocational colleges				
	4. Opportunities brought by regional economic development				
	T (Threats)	ST strategy (diversification) :	WT strategy (defensive) :		
	1. Policies and regulations are slightly lagging behind	Capitalize on strengths and avoid threats		Avoid weaknesses and meet challenges	
	2. The effectiveness of industry-education integration is not high				

Through TOWS combination analysis, there are four strategies for industry-education integration in higher vocational colleges: SO growth strategy, ST diversification strategy, WO reversal strategy, and WT defense strategy. From the TOWS analysis in the above table (Table 2-5), it is easy to see that the industry-education integration in higher vocational colleges is at a historical moment when advantages outweigh disadvantages and opportunities outweigh challenges; it is more effective to play advantages than to make up for disadvantages, and it is more effective to embrace opportunities than to deal with threats. According to the conclusion of the TOWS analysis, the SO growth strategy should be selected. The industry-education integration in higher vocational colleges should give full play to the advantages of accurate school positioning, distinctive professional settings, effective social services and training, emphasis on industry-education integration, and the construction of the teaching staff and incentive measures in place, welcome opportunities such as the introduction of national policies, attention from local governments, and rapid development of regional economy, firmly, continuously and deeply promote the industry-education integration, actively participate in the history of economic transformation, and promote mutual development with the industry.

Steps to developing a strategy

Strategy formation refers to how an organization or individual develops plans and methods to achieve specific objectives. The following are the general steps to forming a strategy :

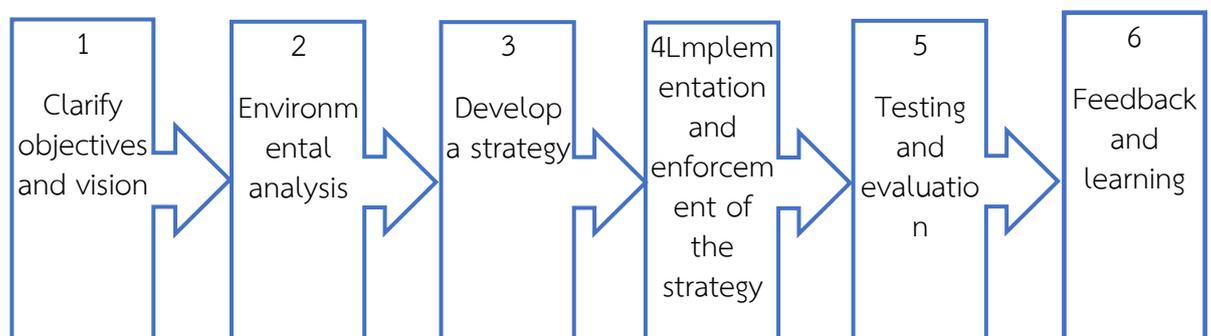


Figure 2.1 Steps in Strategy Formulation

(Source: Heinz Wehrlic, 254)

Clarify objectives and vision: Identify the long-term and short-term objectives that the organization or individual wants to achieve and define the desired vision or state in the future.

Environmental Analysis: A comprehensive analysis of the external environment and external resources. External environmental analysis includes understanding the market, competition, regulations, and technological trends. Internal analysis involves the organization's resources, capabilities, culture, and structure.

The organization's or individual's strategic direction may include selecting market positioning, product or service portfolio, competitive strategy, etc. Based on determining the strategic direction, formulate specific strategies and plans, including resource allocation, action plans, and timetables.

Strategy: Translating the formulated strategy into actual actions. This may involve organizational changes, resource allocation, and external cooperation.

Monitoring and evaluation: Regularly monitor the progress of strategy implementation and evaluate its effectiveness. If necessary, adjust and revise to adapt to the changing environment.

Feedback and Learning: Get feedback from execution and evaluation and use it for learning. This helps to continuously improve strategies and enhance organizational or individual suitability.

In summary, strategy formation is flexible and can adapt to changing external and internal conditions. It typically includes clear objectives and vision, environmental analysis, strategy formulation, implementation and execution, monitoring and evaluation, feedback and learning, and other steps.

Sustainable Development of Higher Vocational Education

Introduce

Sustainable development of vocational education mainly refers to that higher vocational education adheres to the people-centered approach, follows the objective laws of educational development, correctly handles the relationship between the development of higher vocational education itself and economic and social development, builds a sustainable development operation mechanism, reforms the talent training model, enables higher vocational education to always maintain vitality and vigor, cultivates higher vocational and technical talents with sustainable development capabilities, and thus promotes the harmonious development of the entire society.

Regarding the research on the sustainable development of higher vocational education, different scholars have different views on the concept, influencing factors, and implementation paths of the sustainable development of higher vocational education. Details are as follows:

College graduated

Higher vocational education, referred to as HVE, aims to cultivate talents with good professional ethics and suitability for economic and social development, including highly skilled talents required for production, construction, management, and service. It aims to serve students and social development and is oriented towards students' future employment positions. It is both an advanced form of vocational education and an important part of higher education and has the dual attributes of vocational education and higher education.

Higher vocational education is a lifelong educational activity open to members of society, unlike traditional school education. Compared with the full-time higher education system, higher vocational education mainly serves social workers, such as technicians, school teachers, or other workers. As a special form of education, the main purpose of higher vocational education is to help workers continuously update and supplement their technical knowledge, thereby continuously improving their professional and technical capabilities.

Compared with general higher education, higher vocational education focuses on different aspects of talent cultivation. Its teaching orientation and talent cultivation direction are cultivating and delivering high-quality skilled talents with theoretical and cultural knowledge and practical experience for society and enterprises. Therefore, higher vocational education is a kind of employment education guided by the needs of the social talent market.

The concept of sustainable development of higher vocational education

Zhang Hui and Yuan Guixin (2008) believe that the sustainable development of higher vocational education can be explained as adhering to the people-centered approach, following the objective laws of educational development, correctly handling the relationship between the development of higher vocational education itself and economic and social development, building a sustainable development operation mechanism, reforming the talent training model, so that higher vocational education always maintains vitality and vitality, and cultivating higher vocational and technical talents with sustainable development capabilities, thereby promoting the harmonious development of the entire society.

Li Jin (2010) believes that the sustainable development of higher vocational education is an overall concept and a specific educational development strategy. It is first integrated into the overall framework of sustainable development of China's education. At the same time, as a type of sustainable development of education, it directly points to the sustainable development of all schools, all majors, and all students in higher vocational education.

Chen Mingxiu (2003) believes that sustainable development of vocational education means that vocational education follows its development laws, aims to develop in a long-term, continuous, and stable manner in coordination with the social economy, and maximizes coordination with the sustainable development of the social economy as the criterion for realizing its development path.

Mu Jing (2006) believes that the connotation of sustainable development in vocational education can be summarized into six aspects: purposefulness, foresight, sustainability, integrity, openness, and equality of development.

Du Anguo (2010) believes that the sustainable development of higher vocational education mainly refers to higher vocational education adhering to the people-centered approach, following the objective laws of educational development, correctly handling the relationship between the development of higher vocational education itself and economic and social development, builds a sustainable development operation mechanism, reforms the talent training model, enables higher vocational education always to maintain vitality and vigor, and cultivates higher vocational and technical talents with sustainable development capabilities, thereby promoting the harmonious development of the entire society.

Factors Affecting the Sustainable Development of Vocational Education

Liang Lihua includes building teacher teams, improving school conditions, developing school philosophy, and addressing the disconnection between education and demand.

Zhang Miaodi and Jiang Xiaoming, based on an analysis of the employment situation of higher vocational students, pointed out that the key to achieving sustainable development of higher vocational education lies in doing a good job in graduate employment and improving the employment rate of higher vocational students.

Zhou Zhiqing (2004) believes that practical teaching is the main way to achieve the training objectives of higher vocational education. Therefore, the key to promoting the sustainable development of higher vocational education is to do a good job in practical teaching.

Fang Meijun (2004) and others believe that scientific research is the fundamental driving force for promoting the sustainable development of higher vocational education. Only by continuously strengthening the construction of key disciplines, scientific research teams, and scientific research bases can higher vocational education develop its characteristics and become more vital.

Wang Lei (2022) et al. believed that key factors affecting the sustainable development of higher vocational education in China, such as school direction and teaching management, have not been fully recognized, and put forward a series of

countermeasures and suggestions to promote the sustainable development of higher vocational education in China.

Achieving sustainable development path for higher vocational education

Cao Huiting (2018) summarized the experience of sustainable development of German higher vocational education as follows: 1) a diversified, professional, and smooth vocational education system; 2) a strict and complete legal and regulatory system and supervision mechanism; 3) a comprehensive, systematic and scientific teaching and evaluated system; 4) a standardized, professional and practical teacher training and evaluated process; 5) a school-enterprise cooperation model supported by national tax exemptions.

Tang Xinxin (2011) summarized the experience of sustainable development of higher vocational education in the United States as follows: 1) protecting vocational education through legislation; 2) vocational education functions with small-scale effects and services; 3) focusing on practical training design that reflects effectiveness; 4) providing all-round government funding support; 5) attaching importance to multi-faceted cooperation between schools and enterprises.

Luo Mingkong and Li Ying (2004). Australia's experience in the sustainable development of higher vocational education lies in: 1) the state defines the role of education and provides strong support; 2) builds a lifelong education system for all people; 3) guides education based on corporate needs and provides supervision and guarantee based on laws and regulations.

Ye Huaguang (2010) believes that to effectively promote the healthy and sustainable development of higher vocational education in China, it is necessary to consider both the government and the school levels. From the government level, it is necessary not only to speed up the legislation of vocational education, consolidate the social status of higher vocational education, and provide sufficient and stable funding guarantees but also to promote the active participation of enterprises and effectively improve the quality of higher vocational education. From the level of higher vocational colleges, it is necessary to connect with enterprises in student selection, teacher training, funding channels, curriculum objective design,

teaching design, and ability-evaluated plans to promote modern vocational education's innovative and sustainable development. First, adjust the professional structure and optimize the professional settings. Professional construction should highlight professional characteristics and local characteristics; second, effectively promote the reform of teaching methods; third, effectively strengthen the process of vocational ability training that connects with corporate positions.

Yao Hong (2008) believes that the main problems in the development of higher vocational education in China are: 1) unclear school orientation; 2) problems with professional settings; 3) lack of characteristics in curriculum settings; 4) unreasonable teacher team construction; 5) problems with the evaluation system; 6) limited government investment and support. Specific strategies for achieving sustainable development of higher vocational education are proposed: 1) guiding the development of higher vocational education with the concept of sustainable development; 2) establishing a reasonable and accurate school orientation; 3) establishing a flexible, professional construction mechanism; 4) constructing a curriculum system with characteristics of higher vocational education; 5) building a teaching team with dual-qualified teachers as the main body; 6) formulating a practical evaluation indicator system.

Wu Yuqian (2016) summarized the main problems and reasons for the sustainable development of higher vocational education: the imperfect higher vocational education system, insufficient investment in higher vocational education, the flawed legal and regulatory framework for higher vocational education, and the challenges faced by higher vocational colleges in their development. Higher vocational colleges encounter numerous issues in their growth. The reasons are, on the one hand, the outdated concepts of higher vocational education and various deviations in the actual operation of higher vocational colleges; on the other hand, the lack of current laws and regulations on higher vocational education in China, along with the constraints of relevant systems, mechanisms, and other macro-level factors.

Vocational colleges

introduce

The higher vocational colleges in China's higher vocational college system mainly include vocational-technical colleges, vocational colleges, vocational universities, and schools that provide higher vocational education. The higher vocational colleges in our study are the existing higher vocational colleges, higher technical colleges, and vocational undergraduate colleges at the junior college level in China.

Regarding the research on higher vocational colleges, different scholars have different views on the concept of higher vocational colleges, the characteristics of higher vocational college students, and the objectives of talent training in higher vocational colleges. Details are as follows:

Definition of Higher Vocational Colleges

"Higher vocational colleges" are referred to as higher vocational colleges. In 1996, the National People's Congress reviewed and passed the "Vocational Education Law of the People's Republic of China," which was revised in April 2022, clarifying that vocational education in higher vocational colleges is an education type with the same importance as general education, and is an important way to cultivate diverse talents, pass on technical skills, and promote employment and entrepreneurship. As the focus of China's higher education system, Article 15 of the law stipulates that vocational school education is divided into secondary vocational school education and higher vocational school education. Higher vocational colleges are the main body responsible for higher vocational school education.

In 1998, the National People's Congress reviewed and passed the Higher Education Law of the People's Republic of China, which more specifically classified higher education institutions, including universities, independent colleges, higher vocational colleges, and recognized higher education institutions. Thus, the law legally clarified that higher vocational schools are part of higher education.

According to the typological division of education based on the International Standard Classification of Education document published by UNESCO, higher vocational education and general higher education belong to the fifth level of education: the cultivation of subject-based talents is the focus of higher education, while higher vocational education takes the cultivation of technical application talents as its main body. This can appropriately reflect the difference between higher vocational and general education. However, higher vocational education should highlight the main body of technical training and pay more attention to the realization of technicality and professionalism.

My country's higher vocational college system mainly includes vocational and technical colleges, vocational colleges, universities, and schools providing higher vocational education. The higher vocational colleges in our study are the existing higher vocational colleges, higher technical colleges, and vocational undergraduate colleges at the domestic junior college level.

Xie Na (2015) states that higher vocational colleges aim to cultivate technical talents. They aim to cultivate a group of talents with university knowledge and certain professional techniques and skills based on complete secondary education.

Pan Ying (2019) argues that higher vocational colleges require students to master solid professional skills and cultivate and shape their personal and professional qualities, morals, and other ideological and spiritual aspects.

Zhou Zewei, Wang Feifei (2020). As an important part of the higher education system, vocational colleges have always assumed important functions in talent cultivation. In response to the Ministry of Education of China's plan to build a modern vocational education system, vocational college education focuses on cultivating high-level technical application talents.

In summary, higher vocational colleges are part of China's higher education. Their main objective is to cultivate technical talents and students with good professional qualities.

Characteristics of students in higher vocational colleges

Vocational college students are a kind of ordinary students. People have different views on the characteristics of vocational college students. Details are as follows:

Cheng Yan (2013) believes that the characteristics of students in higher vocational colleges are: 1) low cultural level and poor self-control; 2) weak learning initiative and no good learning habits; 3) poor self-care ability and lack of team spirit; 4) low overall quality and lack of social responsibility.

Zhou Jing (2017) believes that the characteristics of college students in higher vocational colleges in the new era are: 1) keen on online entertainment; 2) diverse starting points for learning; 3) lower mental health than ordinary college students; 4) interweaving of pride and inferiority; 5) aversion to learning is relatively common.

Zhang Ye (2018) believes that the student source structure of higher vocational colleges is complex, with great differences in levels, a weak learning foundation, and low learning efficiency. Most students have an improper learning attitude and inferiority complex, which directly affects the quality of student learning and the effectiveness of vocational education.

Wang Zhidian (2019) pointed out that higher vocational colleges have a broader source of students. High school students who have passed the college entrance examination and those who have been admitted to vocational schools through the corresponding programs will also be admitted. All kinds of people from society are admitted through individual recruitment. Because of the recording, The scores obtained are generally low, and the quality of students varies. After entering higher vocational colleges, their behavior and learning attitude show different characteristics in various aspects. First, they like activities but lack self-control; second, they are good at expressing themselves but lack self-confidence; third, they value themselves but have a too flamboyant personality; fourth, they have strong abilities but weak cultural foundations.

Xie Yingjing (2020) pointed out that the entrance scores of vocational college students are lower than those of undergraduate students. The score lines of different majors are also different, and the quality of students is different, so the score gap is significant. Due to the particularity of the students, many vocational college students lack the spirit of hard work, self-consciousness, and interest in learning. Overall, vocational college students may not have the same learning ability as undergraduate students and have poor theoretical learning ability. However, they have strong hands-on abilities and are more enthusiastic about participating in practical courses.

In short, vocational colleges are higher education institutions that focus on cultivating applied and skilled talents. Compared with traditional theoretical education, vocational colleges pay more attention to practical teaching and emphasize applying students' knowledge and skills in actual working environments. Therefore, students in vocational colleges have strong practical ability, professional quality, and high professional ethics.

The objective of talent cultivation in higher vocational colleges

2000, the Ministry of Education's "Opinions on Strengthening Talent Training in Higher Vocational Education" (2000) pointed out: "Higher vocational education should cultivate highly skilled and applied professionals who support the Party's basic line and are adaptable to the needs of production, construction, management, and service. They are well-rounded in moral, intellectual, physical, and aesthetic aspects."

2011, the Ministry of Education's Document No. 12, "Opinions of the Ministry of Education on Promoting Reform and Innovation in Higher Vocational Education and Leading the Scientific Development of Vocational Education" (2011), proposed that higher vocational education should "serve the transformation of economic development mode and the construction of a modern industrial system, and cultivate sufficient and high-quality high-end skilled professionals."

2012, the Ministry of Education released the 12th Five-Year Plan for National Education Development (2012), which pointed out that higher vocational education should "focus on cultivating development-oriented, compound and innovative technical and skilled talents required for industrial transformation and upgrading and

enterprise technological innovation." The specificity of training direction and the upward shift of talent standards have clarified the types of talent training.

He Yinglin (2014) believes that the objective of cultivating skilled personnel in higher vocational colleges is to cultivate high-level technical and skilled personnel who are "oriented to front-line positions such as production, construction, management, and service" and have specific theoretical knowledge relatively rich practical experience, strong hands-on skills, good professional ethics, and specific innovation capabilities. It can be seen that the objective of cultivating skilled personnel in higher vocational colleges consists of four parts: direction objectives, type objectives, level objectives, and specification objectives.

Zhang Yongli and Geng Shigang (2008) believed that higher vocational education should be responsible for cultivating the practical and skilled talents needed to construct ecological civilization.

Xiong Huiping (2008) emphasized that vocational education should be based on the talent training model of "technology → green technology" and implement the fundamental purpose of higher vocational education, which is to cultivate more and better high-skilled talents with "green qualities."

Chen Juan and Ma Guosheng (2010) pointed out that constructing ecological civilization requires many high-tech applied talents. Hence, higher vocational education aims to cultivate high-quality, high-skilled applied talents with innovative ability and spirit.

Li Man (2006) believes that the key to cultivating high-skilled talents is having comprehensive professional abilities and qualities.

Wang Yong (2007) formed the view that the training objective of higher vocational education is "ability-based," focusing on the cultivation of innovative consciousness and innovative ability and focusing on the cultivation of compound talents with comprehensive abilities.

Lin Qiang (2007) also pointed out that cultivating compound talents with comprehensive and sustainable development is the basic orientation of talent training objectives in higher vocational education.

Chajid (2011) believes that in the context of mass higher education, the objective of talent training in higher vocational colleges should be positioned as human resource development.

In summary, we can learn that the talents cultivated by higher vocational colleges are applied talents with strong professional ethics, professional discipline and skills, and professional ideals. However, the core elements of talent training specifications are concentrated on the three keywords of "high quality," "technical," and "skilled."

Related Research

The formulation and practice of sustainable development strategies for industry-education integration in foreign higher vocational colleges

Higher vocational colleges play a core role in industry-education integration. Formulating their sustainable development strategies is crucial to seamlessly integrating vocational education and industry needs. Research shows that foreign higher vocational colleges have formed a relatively mature industry-education integration system through policy support, industry-led cooperation models, dynamic curriculum updates, and student professional ability training. However, they also face challenges such as insufficient motivation for corporate participation and uneven resource allocation.

Foreign higher vocational colleges attach great importance to policy coordination and top-level design in the sustainable development of industry-education integration. Smith and Johnson (2018) pointed out that German higher vocational colleges, with the support of government policies, jointly develop training programs with enterprises to ensure that the course content is highly consistent with industry needs. In addition, Germany has clarified the responsibilities of enterprises in vocational education through the Federal Vocational Education Act and provided tax incentives for participating enterprises, forming a virtuous circle of policy coordination. For example, the German University of Applied Sciences

(Fachhochschule) has formed a "dual system" vocational education model through cooperation with the government and enterprises.

Gonon (2019) emphasized that with the government's support, Swiss higher vocational colleges have established an industry-led curriculum development mechanism to ensure that the educational content is highly consistent with the needs of the industry. At the same time, Switzerland has achieved in-depth cooperation between higher vocational colleges and enterprises through the "Vocational Education and Training (VET) System." Swiss Higher Professional Colleges (Fachhochschule Schweiz) closely combines vocational education with labor market needs through a national policy framework.

School-enterprise cooperation is the core of integrating industry and education in higher vocational colleges. Foreign higher vocational colleges have explored cooperation models and benefit-sharing mechanisms. Miller (2020) pointed out that American community colleges have signed cooperation agreements with enterprises to jointly develop courses, design practical training projects, and invite enterprise experts to participate in teaching to ensure that students master the latest industry skills. In addition, the United States has encouraged enterprises to participate in vocational education through the "tax credit" policy, forming a benefit-sharing mechanism. American community colleges have formed a "school-enterprise co-construction curriculum" model by cooperating with local enterprises.

Smith (2017) pointed out that Australian vocational colleges ensure that vocational education courses are highly matched with industry needs by establishing industry skills committees (ISCs). At the same time, enterprises directly benefit from high-quality technical talents by participating in course design and evaluation. Australian TAFE colleges have achieved sustainable development of industry-education integration through industry-led cooperation models.

Foreign vocational colleges focus on dynamic docking with industry needs in curriculum reform. Tan (2020) pointed out that Singapore's vocational colleges have developed a modular and project-based curriculum system through cooperation with enterprises and introduced a "micro-certificate" system to help learners quickly

master new skills. In addition, Singapore provides citizens with learning subsidies through the "Lifelong Learning Account" to encourage them to continuously improve their professional skills. Singapore Polytechnic promotes the continuous updating of vocational education courses through the "SkillsFuture" program.

Fuller and Unwin (2018) pointed out that British vocational colleges require large enterprises to provide financial support for vocational education through the "apprenticeship tax" policy while ensuring that the content of apprenticeship training is consistent with industry standards. The British Continuing Education College combines course content with vocational qualification certification through the "apprenticeship system" reform.

Foreign vocational colleges attach great importance to cultivating students' career development capabilities in integrating industry and education. Virolainen (2019) pointed out that Finnish vocational colleges emphasize students' autonomy and practical ability and provide students with rich internship and employment opportunities through in-depth cooperation with enterprises. The University of Applied Sciences of Finland helps students choose courses according to their interests and career goals by designing "personalized learning paths."

Yoshimoto (2021) pointed out that Japanese vocational colleges provide continuous skills training for workers by establishing vocational ability development institutions and encouraging enterprises to provide employees with on-the-job learning opportunities, forming a virtuous "learning cycle." Japanese vocational schools promote lifelong learning through the "vocational ability development system."

Research on the development strategy of industry-education integration in China's higher vocational colleges

Liu Xiangda (2023) proposed that industry-education integration is the path to the sustainable development of vocational education. He believes that adapting to the needs of national development, industrial structure adjustment, and talent demand changes, accelerating the transformation of their development mode, and taking the path of vocational education innovation and excellence through "industry-

education integration" is the path for higher vocational colleges to improve the quality of education and serve the sustainable development of the economy and society. He also believes that reforming the vocational education system and talent training model, adhering to "industry-education integration," promoting the further integration of college professional construction and industrial (industry) development "supply and demand," establishing a dynamic professional adjustment mechanism, forming a scientific and reasonable "professional group" and "professional chain," actively capturing market information, and thoroughly solving the lag in professional setting and curriculum teaching, and realizing the advanced connection between courses and positions are effective ways for vocational colleges to improve students' employment quality and deepen "industry-education integration." It is also the path of sustainable development for vocational education to write a new era of striving for progress.

Chen Yiwen (2019) conducted a SWOT analysis on the industry-education integration at Guizhou A Vocational and Technical College and finally proposed strategies for the development of industry-education integration in higher vocational colleges in Guizhou Province: strategy of actively adapting professional structure to industrial structure, strategy of giving full play to the main role of enterprises, strategy of exporting and tracking innovative talents, and strategy of innovation in investment structure.

Yang Hongfang (2024) discussed the paths and strategies for promoting industry-education integration and school-enterprise cooperation in higher vocational education. He believes that the current situation of school-enterprise cooperation and industry-education integration in higher vocational colleges is: 1) schools do not pay enough attention, and the industry-education integration is not deep; 2) enterprises lack the motivation to participate in school-enterprise cooperation; 3) the effect of school-enterprise cooperation is not obvious; 4) there is a lack of rigid constraints from relevant laws and regulations. He proposed the path to promote school-enterprise cooperation and industry-education integration: 1) establish and improve the relevant system of school-enterprise cooperation and continuously

optimize the development environment of industry-education integration; 2) schools change their concepts, increase efforts to strengthen school-enterprise cooperation, and establish a long-term mechanism for school-enterprise cooperation ; 3) promote curriculum reform to make the curriculum structure more in line with requirements; 4) improve the school-enterprise cooperation system, and improve the two-way combination mechanism of supply and demand of industry and education; 5) division of labor and cooperation, and improve the implementation process.

Research on the operation mechanism of industry-education integration in higher vocational education

Liao Huiqin (2017) studied the operation mechanism of industry-education integration in higher vocational education in Guangdong Province. She believes that the following problems exist in the operation mechanism of industry-education integration in higher vocational colleges in Guangdong Province: 1) The participation enthusiasm of school operators is not high; 2) The responsibilities between school operators are not clear; 3) The teaching quality of higher vocational colleges is still not high; 4) The development resources are uneven among higher vocational colleges. The countermeasures for the effective operation of the operation mechanism of industry-education integration in higher vocational education in Guangdong Province are proposed: 1) Build a sound self-organization mechanism; 2) Build a dynamic talent supply and demand mechanism; 3) Build a flexible resource regulation mechanism.

Shen Meng (2020) studied the implementation mechanism of industry-education integration and school-enterprise cooperation in vocational education in Yunnan Province. She believes that the current problems of industry-education integration and school-enterprise cooperation in vocational education in Yunnan Province are: 1) The government's leading role in promoting industry-education integration and school-enterprise cooperation in vocational education is weak; 2) The teacher structure is unreasonable, making it difficult to assist schools for industry-education integration and school-enterprise cooperation; 3) The government, industry enterprises and schools lack coordination, and policies are difficult to implement;

4) The industrial foundation is weak, and there is a lack of cooperation platforms; 5) It is difficult to maintain corporate interests, and there is a lack of talent and positions; 6) Information transmission between subjects is difficult and the operating cost is high; 7) The society has a low sense of cultural identity with vocational education. It is proposed to optimize the implementation mechanism of industry-education integration and school-enterprise cooperation in vocational education in Yunnan Province: 1) Establish a clear system of rights and responsibilities for industry-education integration and school-enterprise cooperation; 2) Establish a reasonable division of functions for industry-education integration and school-enterprise cooperation; 3) Establish a sustainable operation mechanism for industry-education integration and school-enterprise cooperation.

Research on the policy of industry-education integration in higher vocational education

Domestic scholars generally believe that policy design is the key to the success of industry-education integration. Li Ming (2020) pointed out that the government should lead industry-education integration and promote school-enterprise cooperation through policy guidance and financial support. Wang Hua (2021) emphasized that institutional innovation is an important guarantee for industry-education integration and suggested establishing mechanisms such as credit recognition and dual-qualified teacher certification to promote in-depth cooperation between schools and enterprises.

Zhang Wei (2019) proposed that industrial colleges and mixed-ownership schools effectively deepen industry-education integration. Higher vocational colleges can co-build industrial colleges with enterprises through policy support to achieve resource-sharing and complementary advantages. Liu Fang (2022) further analyzed the problems existing in policy design, such as policy fragmentation and poor operability, and suggested strengthening top-level design and forming a systematic policy system.

Domestic scholars have extensively researched the implementation effect of industry-education integration policies. He Yan (2021) Through the study of the industry-education integration policy of higher vocational colleges in Nanchang, it was found that the deviation of policy effect is mainly reflected in the small number of participating enterprises, the lack of demonstration effect, and the limited effect of the external coordination mechanism. She believes that unclear policy connotations, insufficient operability, and lack of supervision and evaluation are the main reasons for the deviation of policy effect.

Chen Jing (2021) investigated many higher vocational colleges and found that the industry-education integration policy has the problem of "focusing on form and neglecting effectiveness" in the implementation process. Many school-enterprise cooperation projects remain on the surface and fail to truly achieve the deep integration of education and industry. She suggested strengthening the supervision and evaluation of policy implementation to ensure that the policy is implemented and effective.

International research emphasizes the importance of comprehensive policy frameworks that clearly define all stakeholders' roles, responsibilities, and incentives. In Germany, a robust legal framework supports the dual education system, including the Vocational Training Act, which mandates industry participation in vocational education. Euler (2013) notes that this legislation ensures a clear division of responsibilities between vocational schools, enterprises, and government agencies, creating a cohesive ecosystem for industry-education integration.

Similarly, Switzerland's vocational education and training (VET) system is governed by a national policy framework that promotes collaboration between vocational schools and industry associations. Gonon (2019) highlights that the Swiss government provides financial incentives and regulatory support to encourage enterprises to participate in vocational training programs. This approach ensures that policies are not only well-designed but also effectively implemented.

A critical factor in the success of industry-education integration policies is the provision of incentives for enterprises to participate. In Australia, the Technical and Further Education (TAFE) system offers tax benefits and subsidies to companies that engage in vocational training. Smith (2017) explains that these incentives are complemented by industry skill councils (ISCs), which work closely with vocational colleges to align training programs with labor market needs.

Effective monitoring and evaluation mechanisms are essential for ensuring the successful implementation of industry-education integration policies. In the United States, the Workforce Innovation and Opportunity Act (WIOA) mandates regular assessments of training programs to ensure they meet industry standards. Miller (2020) explains that these assessments are conducted by independent agencies, which provide feedback and recommendations for improvement.

International research also provides insights into addressing common policy gaps and weaknesses. In Finland, vocational education policies are regularly reviewed and updated to reflect changing industry needs. Virolainen (2019) notes that this iterative approach ensures that policies remain relevant and effective. Additionally, Finland emphasizes stakeholder engagement, involving employers, educators, and students in the policy development process.

Chapter 3

Research Methods

This study adopted a mixed research method and was divided into three stages.

The first stage is to answer research objective 1) to study the current status of industry-education integration development in higher vocational colleges in Guangdong Province.

The second stage is to answer research objective 2) to formulate strategies for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.

The third stage is to answer research objective 3) to evaluate strategies for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.

In order to achieve the above research objectives, the researchers adopted the following research procedures:

1. The Population/The sample group
2. Research instruments
3. Data Collection
4. Data Analysis

The first stage is to study the current status of the industry-education integration in higher vocational colleges in Guangdong Province.

The Population/The sample group

Research object

There are 93 higher vocational colleges in Guangdong Province, with 1.254 million students and about 50,000 Educational administrators and teachers. According to the development teacher level of higher vocational colleges, this study

selected Educational administrators and students from five representative higher vocational colleges in Guangdong Province, including the first in the country, the provincial, the middle in the province, the poor in the province, and the representatives of private higher vocational colleges in the province, as the subjects of the questionnaire survey, and the Educational administrators are also interviewed. In addition, industry-education integration involves the participation of enterprises. Therefore, according to the development level of enterprises, this study selected three representative enterprise personnel in Guangdong Province, including national enterprises, provincial enterprises, and municipal enterprises, as interview subjects.

Sample Group

Collection of questionnaire samples

According to the sampling table of Krejcie R.V. and Morgan D.W. (1970), the sample group of this study randomly selected 384 students and 361 Teacher Educational administrators from 5 higher vocational colleges in Guangdong Province for questionnaire surveys. The students and teachers of these higher vocational colleges are more representative regarding industry-education integration. In order to ensure the representativeness of the sample group, this study will strive to ensure that the sample group reflects the characteristics of the entire population in terms of gender, age, grade, etc. In selecting the sample group, this study will follow scientific sampling principles such as randomness and representativeness to ensure the validity and credibility of the research results. At the same time, this study will respect each participant's rights and privacy to ensure the research's ethics.

Table 3.1 Sample size table of questionnaire survey (students)

No	Vocational colleges	Population	Number of samples	Reason
1	Shenzhen Polytechnic	33475	119	No.1 in China
2	Guangdong Industry Technical College	25794	92	No. 1 in the province
3	Heyuan Vocational and Technical College	17664	63	Moderate in the province
4	Shanwei Vocational and Technical College	9786	35	Provincial Mission
5	Guangzhou Huali Vocational College of Science and Technology	21014	75	Representatives of private higher vocational colleges
Total		107733	384	

Table 3.1 Sample size of questionnaire survey (education administrators)

No	Vocational colleges	Population	Number of samples	Reason
1	Shenzhen Polytechnic	1967	125	No.1 in China
2	Guangdong Industry Technical College	1502	95	No. 1 in the province
3	Heyuan Vocational and Technical College	670	43	Moderate in the province
4	Shanwei Vocational and Technical College	520	33	Provincial Mission
5	Guangzhou Huali Vocational College of Science and Technology	1032	65	Representatives of private higher vocational college:
Total		5691	361	

Interviewer

This study interviewed seven educational administrators from five higher vocational colleges and three senior corporate managers from three enterprises. The educational administrators must meet the following conditions: 1) have worked at the school for more than 15 years; 2) be responsible for school-enterprise cooperation, industry-education integration, and other specific tasks; 3) hold the title of associate professor or higher; 4) be willing to participate in recording the structured interview; 5) be willing to review the interview records for verification.

Senior corporate managers must fulfill the following requirements: 1) their company collaborates with higher vocational colleges; 2) they have over 15 years of experience in the enterprise; 3) they participate in the formulation of corporate development policies; 4) they must be willing to engage in structured interview recordings; 5) they need to review the interview record for verification.

Table 3.3 List of Interviewer (Educational administrators)

No	Vocational colleges	Interviewee	Reason
1	Shenzhen Polytechnic	2	No.1 in China
2	Guangdong Industry Technical College	1	No. 1 in the province
3	Heyuan Vocational and Technical College	2	Moderate in the province
4	Shanwei Vocational and Technical College	1	Provincial Mission
5	Guangzhou Huali Vocational College of Science and Technology	1	Representatives of private higher vocational colleges
Total		7	

Table 3.2 List of Interviewer (senior corporate managers)

No	Enterprise	Interviewee	Reason
1	Nongfu Spring Co., Ltd.	1	National Enterprise
2	Guangdong Yada Electronics Co., Ltd.	1	Provincial Enterprises
3	Minglei Laser Intelligent Equipment (Heyuan) Co., Ltd.	1	Municipal Enterprises
Total		3	

Research Instruments

The tools used in this study include literature research, questionnaires, and interview forms.

2.1 Literature research

Literature research is the basis of scientific research. Careful literature analysis helps researchers be familiar with the research status of related fields and find problems. At the same time, it also helps researchers understand the feasibility and necessity of research problems. This study details the research status of domestic and foreign scholars in industry-education integration development in higher vocational colleges and refines the relevant research perspectives. Drawing on the successful experience of domestic and foreign research, the research is conducted according to the actual situation of the research object.

2.2 Questionnaire survey

Questionnaire design

Part I: The questionnaire is designed by the researcher, and the validity and feasibility of the questionnaire are tested. Information on the Interviewer, including gender, identity, and higher vocational college.

Part II: This study mainly conducts a questionnaire survey on the current status of industry-education integration development in higher vocational colleges, including the performance of higher vocational college students in industry-

education integration, the performance of higher vocational colleges in industry-education integration, the performance of enterprises in industry-education integration, and the performance of government in industry-education integration. The data interpretation standards based on the Likert five-point scale are as follows:

5 indicates that the level of industry-education integration development in higher vocational colleges is the highest level.

4 indicates that the industry-education integration development in higher vocational colleges is at a high level.

3 indicates that the industry-education integration development in higher vocational colleges is at a Moderate level.

2 indicates that the industry-education integration development in higher vocational colleges is at a low level.

1 indicates that the industry-education integration development in higher vocational colleges is at the lowest level.

Based on the average value of Rensis Likert (1932), the data interpretation is as follows:

4.50 - 5.00 indicates the highest level

3.50 - 4.49 indicates a high level

2.50 - 3.49 indicates a Moderate level

1.50 - 2.49 indicates a low level

1.00 - 1.49 indicates the lowest level

The process of preparing the questionnaire

1. Review and analyze the literature, concepts, theories, and research related to the development of industry-education integration in higher vocational colleges.

2. Prepare a questionnaire on the current status of industry-education integration development in higher vocational colleges. Then, send the questionnaire outline to the thesis supervisor, who will review and modify the questionnaire content according to the suggestions.

3. Five experts checked the questionnaire for the Index of Objective Congruence (IOC) (Brian Foote, 1988).

4. The questionnaire was revised based on the experts' suggestions.
5. The questionnaire was distributed to 30 students and 30 teachers for trial use. Kornbach's alpha coefficient demonstrated a reliability of 0.959 and 0.955.
6. A questionnaire survey was conducted on 384 students and 361 teachers from 5 higher vocational colleges in Guangdong Province, and data collection is awaited.

2.3 Interview Form

Based on the results of the questionnaire survey and the analysis of the current situation of industry-education integration in higher vocational colleges, a corresponding structured interview form was developed from aspects including how to improve the industry-education integration development strategy at the level of higher vocational college students, how to improve the industry-education integration development strategy at the level of higher vocational colleges, how to improve the industry-education integration development strategy at the level of enterprises, and how to improve the industry-education integration development strategy at the government level. Structured interviews were conducted with seven Educational administrators from 5 representative higher vocational colleges in Guangdong Province and three senior managers from 3 representative enterprises in Guangdong Province. The purpose is to find out the specific implementation of how to improve the industry-education integration development strategy in higher vocational colleges.

The structured interview is divided into two parts:

Part I: Personal information of the interviewees, classified by the interviewees' titles, positions, education, years of work, interview time, and interview date.

Part II: Suggestions on the current situation of industry-education integration development in higher vocational colleges from four aspects: 1) How to improve the industry-education integration development strategy at the level of higher vocational college students, 2) How to improve the industry-education integration development strategy at the level of higher vocational colleges, 3) How to improve the industry-education integration development strategy at the enterprise level, and 4) How to

improve the industry-education integration development strategy at the government level.

Constructing a structured interview process

1. Review and analyze the literature, concepts, theories, and research on promoting the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.

2. A structured interview that proposes suggestions on the current status of industry-education integration in higher vocational colleges from four aspects: 1) How to improve the development strategy of industry-education integration at the student level of higher vocational colleges, 2) How to improve the development strategy of industry-education integration at the level of higher vocational colleges, 3) How to improve the development strategy of industry-education integration at the enterprise level, and 4) How to improve the development strategy of industry-education integration at the government level. Then, I will submit the structured interview outline to the thesis instructor for review and modify the content according to the suggestions.

3. Three experts will check the interview's content and revise it according to their suggestions.

Data Collection

For the data collection method of "objective 1: Study the current status of industry-education integration development in higher vocational colleges in Guangdong Province," the specific steps are as follows:

Step 1: Study the concepts and theories in relevant literature, textbooks, and research reports.

1. The research method includes studying the theoretical concepts in literature, textbooks, and research related to the current status of industry-education integration development in higher vocational colleges.

2. Data sources include literature, textbooks, and related research.

3. The research variables are the impact of students on industry-education integration, the effect of higher vocational colleges on industry-education integration, the impact of enterprises on industry-education integration, and the impact of the government on industry-education integration.

4. The tool is a literature research table (literature analysis).

5. The researchers collected data from documents, textbooks, and related research.

6. The researchers used content analysis to summarize the essence of the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province.

Step 2: A questionnaire survey of 384 students and 361 teachers

1. The researchers applied to the Graduate School of Bansomdejchaopraya Rajabhat University to collect data from 384 students and 361 teachers in 5 higher vocational colleges in Guangdong Province.

2. The researchers distributed questionnaires to 384 students and 361 teachers in 5 higher vocational colleges in Guangdong Province to ensure the questionnaire recovery rate reached 100%.

Step 3: Interviewing Educational administrators and senior corporate managers

1. The researcher asked the Graduate School of Bansomdejchaopraya Rajabhat University to send an invitation letter to collect interview data from 7 educational administrators of 5 vocational colleges in Guangdong Province and 3 senior corporate managers from 3 companies.

2. The researcher sent an invitation letter to the interviewees who participated in proposing strategies.

3. The researcher interviewed ten participants, and each interview lasted no less than thirty minutes.

4. The researcher conducted face-to-face interviews with ten participants, ensuring that 100% of the ten interview forms were collected.

Data Analysis

The researchers used the software package (SPSS) program to analyze the data as follows:

1. According to the classification of gender, identity, and higher vocational colleges, the questionnaire survey subjects and interviewers' personal information was analyzed by frequency and percentage.

2. Descriptive statistical methods were used to process the questionnaire statistical data, and the status of the development of industry-education integration in higher vocational colleges in Guangdong Province was analyzed using mean and standard deviation.

3. Content analysis was used to analyze and organize the interview data, extract and summarize adequate information, and combine the previous research foundation to propose a draft strategy and related measures to promote the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.

4. PEST analysis was used to analyze the macro-environmental factors affecting the development of industry-education integration in higher vocational colleges in Guangdong Province. The four major external factors closely related to this development, namely politics, economy, society, and technology, were found.

5. Use SWOT analysis to analyze the internal and external competitive environment and situation under competitive conditions that affect the development of industry-education integration in higher vocational colleges in Guangdong Province, find out the various significant internal advantages, disadvantages, and external opportunities and threats closely related to the development of industry-education integration in higher vocational colleges in Guangdong Province, and draw a series of corresponding conclusions from them, to prepare for the formulation of corresponding development strategies based on the research results.

6. Combine PEST analysis and SWOT analysis to form a SWOT-PEST influencing factor analysis matrix to find the corresponding development strategy based on the results of the SWOT-PEST analysis.

The second stage is to formulate strategies for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.

1. Research subjects/sample group

When formulating strategies for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province, experts were used to evaluate the draft strategy and put forward reasonable and practical suggestions. This study selected 25 education managers from 5 higher vocational colleges as strategy draft evaluation team members. Education managers must meet the following conditions: 1) have worked in the school for more than 15 years; 2) be responsible for the school-enterprise cooperation, industry-education integration, and other specific work; 3) must be willing to participate in the focus interview discussion; 4) must be willing to review the interview records for verification.

Table 3.5 List of experts for strategy draft evaluation

No	Vocational colleges	Strategy draft evaluation expert	Reason
1	Shenzhen Polytechnic	5	No.1 in China
2	Guangdong Industry Technical College	5	No. 1 in the province
3	Heyuan Vocational and Technical College	5	Moderate in the province
4	Shanwei Vocational and Technical College	5	Provincial Mission
5	Guangzhou Huali Vocational College of Science and Technology	5	Representatives of private higher vocational colleges
Total		25	

2. Research instruments

Strategy draft evaluation form

Analyze, organize, extract, and summarize adequate information based on the processing results of the questionnaire survey statistics and the interview results; conduct SWOT-PEST influencing factor matrix analysis and TOWS matrix analysis; form a strategy draft and formulate a strategy draft evaluation form based on the content of the strategy draft.

3. Data collection

For objective 2: the data collection method steps for improving the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province are as follows:

Step 1: Based on the results of the first stage, form a draft strategy for improving the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.

Step 2: The researcher commissioned the Graduate School of Bansomdejchaopraya Rajabhat University to send a letter to collect 25 Educational administrators from 5 higher vocational colleges in Guangdong Province to conduct a strategy draft evaluation and suggest practical suggestions.

Step 3: The researchers and 25 strategy draft evaluation experts distributed the 25 evaluation forms individually to ensure that 100% of them were collected.

4. Data analysis

1. Formulate strategy draft evaluation rules. Drafts with a percentage of approval of more than 50% will be adopted. Otherwise, they will be abandoned.

2. Conduct frequency and percentage analysis on the collected draft strategy evaluation forms and conduct content analysis on the draft strategy evaluation suggestions.

3. Analyze and organize the draft strategy evaluation results, extract and summarize adequate information, and formulate a sustainable development strategy to improve the industry-education integration in higher vocational colleges in Guangdong Province.

The third stage evaluates the suitability and feasibility of the strategy for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.

1. Research object/sample group

Evaluation strategy sample

The five industry-education integration strategy evaluation experts are from Guangdong Light Industry Vocational and Technical College and Heyuan Vocational and Technical College. They significantly influence the strategic formulation, sustainable development, industry-education integration, talent training, and education management of higher vocational colleges. Qualifications of experts: 1) have worked in the school for more than 15 years; 2) be responsible for the school-enterprise cooperation, industry-education integration, and other specific work; 3) have the title of associate professor or above; 4) must be willing to participate in the structured interview recording; 5) must be willing to review the interview record for verification.

Table 3.6 List of experts in the evaluation team

No	Vocational colleges	Evaluation Expert	Reason
1	Shenzhen Polytechnic	5	No.1 in China
2	Guangdong Industry Technical College	5	No. 1 in the province
3	Heyuan Vocational and Technical College	5	Moderate in the province
4	Shanwei Vocational and Technical College	5	Provincial Mission
5	Guangzhou Huali Vocational College of Science and Technology	5	Representatives of private higher vocational colleges
Total		25	

2. Research instruments

Evaluation form

This tool collects data for objective three and evaluates the suitability and feasibility of the strategy sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. Five experts from Shenzhen Vocational and Technical University, Guangdong Light Industry Vocational and Technical College, Heyuan Vocational and Technical College, Shanwei Vocational and Technical College, and Guangzhou Huali Vocational College of Science and Technology were invited to evaluate the suitability and feasibility of the strategy.

The evaluation form is divided into two parts:

Part I: Personal information of experts, classified by job position, work experience, educational background, and academic title.

Part II: Improve the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province. The data interpretation standard adopts the Likert five-point scale (1932), and the data interpretation is as follows:

5 means that the suitability and feasibility of the strategy have reached the highest level.

4 means that the suitability and feasibility of the strategy have reached a high level.

3 means that the suitability and feasibility of the strategy are at a Moderate level.

2 means that the suitability and feasibility of the strategy are at a low level.

1 means that the suitability and feasibility of the strategy are at the lowest level.

The data interpretation of the average value is based on Rensis Likert (1932). The data is explained as follows:

4.50 - 5.00 indicates the highest level.

3.50 - 4.49 indicates a high level.

2.50 - 3.49 indicates a Moderate level.

1.50 - 2.49 indicates a low level.

1.00 - 1.49 indicates the lowest level.

3. Data collection

Data collection methods for objective 3: Evaluate the suitability and feasibility of improving the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province.

The results of the third phase are used to evaluate the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province. The specific steps are as follows:

Step 1: The researcher wrote to the Graduate School of Bansomdejchaopraya Rajabhat University to solicit evaluation opinions from five experts from Shenzhen Polytechnic, Guangdong Light Industry Vocational and Technical College, Heyuan Vocational and Technical College, Shanwei Vocational and Technical College, and Guangzhou Huali Vocational College of Science and Technology to formulate a sustainable development strategy for industry-education integration in higher vocational colleges in Guangdong Province.

Step 2: The researcher distributed evaluation forms to the five experts, selected a suitable time and place to contact them, and guided them in scoring the evaluation forms to ensure the collection rate of the evaluation forms reached 100%.

Step 3: The researchers invited the experts to complete the evaluation form.

Step 4: The researchers summarized and analyzed the results of the evaluation forms.

4. Data Analysis

Descriptive statistics were used to evaluate the suitability and feasibility of the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province. The strategies and measures proposed in this study were evaluated using mean and standard deviation.

The summary of the three-stage research method is shown in Figure 3.1

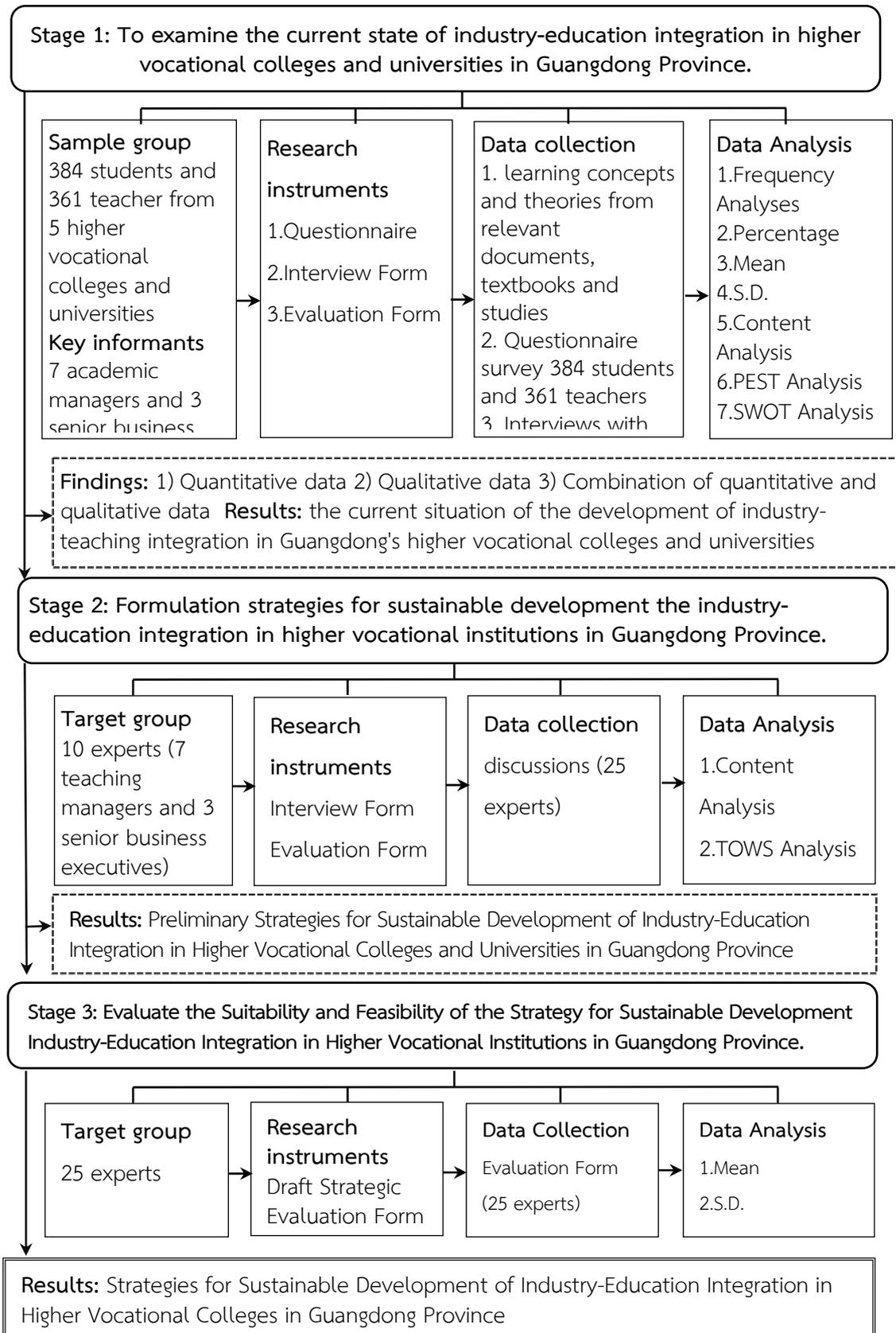


Figure 3.1 Research methods

Chapter 4

Analysis Results

According to the research objectives and requirements of Strategies for the Sustainable Development of Industry-Education Integration in Higher Vocational Colleges in Guangdong Province, the survey data and interview results were analyzed.

The first stage is to answer the Research objectives 1: to study the current status of the industry-education integration in higher vocational colleges in Guangdong Province. The researchers adopted the following research procedures:

1. Questionnaire data analysis
2. Interview record analysis
3. SWOT-PEST analysis

The second stage is to answer the Research objectives 2: to formulate Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. The researchers adopted the following research procedures:

1. TOWS analysis to form a draft strategy
2. Evaluate the draft strategy and formulate a sustainable development strategy for the industry-education integration in higher vocational colleges in Guangdong Province

The third stage is to answer the Research objectives 3: to evaluate the suitability and feasibility of the strategy to improve the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. The researchers adopted the following research procedures:

1. Expert evaluation of the suitability and feasibility of the strategy

The specific analysis is as follows:

Symbol and Abbreviations

n Refers to a sample group

\bar{x} Refers to the mean

S.D. Refers to standard deviation

The first stage is to answer Research to study the current status of industry-education integration in higher vocational colleges in Guangdong Province.

Questionnaire data analysis

The author created the questionnaire used in this survey. The options were designed based on relevant literature and the results of structured interviews. The questionnaire is divided into two parts: the first includes basic personal information, and the second investigates the current status of industry-education integration in higher vocational colleges in Guangdong Province. For specific details of the questionnaire, please refer to Appendix C.

This study distributed 1,000 questionnaires, 500 for students and 500 for teachers of higher vocational colleges. Eight hundred forty-two responses were collected, with a response rate of 84.20%, including 454 responses from students, a response rate of 90.80%, 384 valid questionnaires, and an effective rate of 84.58%; 388 responses from teachers, a response rate of 77.60%, and 361 valid questionnaires, with an effective rate of 93.04%.

Part I: Personal information of students participating in the questionnaire on the current status of industry-education integration, classified by school and gender; personal information of teachers participating in the questionnaire on the current status of industry-education integration, classified by school and gender.

Table 4.1 Number and Percentage of Interviewers

Students n=384, teachers n=361

Personal information		Students		Teachers	
		Number	Percent (%)	Number	Percent (%)
Higher vocational college	Shenzhen Polytechnic	119	30.99	125	34.63
	Guangdong Polytechnic of Light Industry	92	23.96	95	26.31
	Heyuan Polytechnic	63	16.41	43	11.91
	Shanwei Polytechnic	35	9.11	33	9.14
	Guangzhou Huali Polytechnic	75	19.53	65	18.01
	Total	384	100.0	361	100.0
Gender	Male	166	43.23	121	33.52
	Female	218	56.77	240	66.48
	Total	384	100.0	361	100.0

According to Table 4.1, the distribution of Interviewer shows that 119 students from Shenzhen Polytechnic University accounted for 30.99%, 125 teachers accounted for 34.63%; 92 students from Guangdong Polytechnic University accounted for 23.96%, and 95 teachers accounted for 26.32%; 63 students from Heyuan Polytechnic College accounted for 16.41%, and 43 teachers accounted for 11.91%; 35 students from Shanwei Polytechnic College accounted for 9.11%, and 33 teachers accounted for 9.14%; 75 students from Guangzhou Huali Polytechnic College accounted for 19.53%, and 65 teachers accounted for 18.01%; among them, 166 male students accounted for 43.23%, and 121 male teachers accounted for 33.52%; 218 female students accounted for 56.77%, and 240 female teachers accounted for 66.48%.

Part II: Analysis of the current status of industry-education integration in higher vocational colleges in Guangdong Province

The questionnaire used in this study was specially designed by the researcher for this study, with a total of 4 aspects and 26 measures. All scales use the Likert 5-point scale, with a maximum of 5 and a minimum of 1. According to the results of the questionnaire survey, this paper analyzes the mean and standard deviation of the current status of industry-education integration in higher vocational colleges in Guangdong Province from 1) students' performance in industry-education integration, 2) higher vocational colleges' performance in industry-education integration, 3) enterprises' performance in industry-education integration, and 4) government's performance in industry-education integration. The survey results are as follows:

Table 4.2 Mean and standard deviation of the current status of industry-education integration in four aspects of higher vocational colleges in Guangdong Province

Current status of industry education integration	Students				Teachers			
	\bar{X}	S.D.	Level	Order	\bar{X}	S.D.	Level	Order
1. Governments' performance in industry-education integration	3.68	0.83	high	3	3.73	0.70	high	4
2. Higher vocational colleges' performance in industry-education integration	3.76	0.82	high	2	4.10	0.62	high	2
3. Enterprises' performance in industry-education integration	3.63	0.81	high	4	3.95	0.59	high	3
4. Students' performance in industry-education integration	3.86	0.82	high	1	4.21	0.55	high	1
Total	3.73	0.82	high		4.00	0.61	high	

According to Table 4.2, students and teachers of higher vocational colleges in Guangdong Province believe that the current status of the four aspects of the industry-education integration is at a high level ($\bar{X}=3.72$) and ($\bar{X}=4.0$). Students and

teachers all agree that the highest level is the performance of students in the industry-education integration ($\bar{X}=3.86$) and ($\bar{X}=4.21$), followed by the performance of higher vocational colleges in the industry-education integration ($\bar{X}=3.76$) and ($\bar{X}=4.10$), among which the performance of the government in the industry-education integration ($\bar{X}=3.68$) and ($\bar{X}=3.73$), and the performance of enterprises in the industry-education integration ($\bar{X}=3.63$) and ($\bar{X}=3.95$). The results show that the performance of students and teachers in the industry-education integration in higher vocational colleges in Guangdong Province is consistent.

Table 4.3 Mean and standard deviation of government performance in industry-education integration

Government performance in industry-education integration	Students n=384, Teachers n=361							
	Students				Teachers			
	\bar{X}	S.D.	Level	Order	\bar{X}	S.D.	Level	Order
1. The government is deeply involved in the industry-education integration projects of higher vocational colleges	3.66	0.80	high	3	3.60	0.67	high	5
2. The government plays a good role in promoting the industry-education integration of higher vocational colleges	3.64	0.85	high	4	3.79	0.66	high	3
3. The government provides a complete system guarantee for the industry-education integration of higher vocational colleges	3.77	0.76	high	1	3.88	0.62	high	1

Table 4.3 (Continued)

Students n=384, Teachers n=361

Government performance in industry-education integration	Students				Teachers			
	\bar{X}	S.D.	Level	Order	\bar{X}	S.D.	Level	Order
4. The government provides sufficient financial support for the industry-education integration projects of higher vocational colleges	3.62	0.90	high	5	3.74	0.72	high	4
5. The government provides sufficient human resources support for the industry-education integration projects of higher vocational colleges	3.72	0.81	high	2	3.85	0.67	high	2
6. The government provides other support for the industry-education integration projects of higher vocational colleges	3.64	0.89	high	4	3.54	0.84	high	6
Total	3.68	0.83	high		3.73	0.70	high	

According to Table 4.3, it is found that students and teachers of higher vocational colleges in Guangdong Province believe that the government's performance in the development of industry-education integration is at a high level ($\bar{X}=3.68$) and ($\bar{X}=3.73$). Students and teachers all agree that the highest level is that the government provides a complete institutional guarantee for the industry-education integration in higher vocational colleges ($\bar{X}=3.77$) and ($\bar{X}=3.88$). The second highest level is that the government provides sufficient human resources support for the industry-education integration in higher vocational colleges ($\bar{X}=3.72$) and ($\bar{X}=3.85$). Next, they are basically consistent in several other aspects. The government is deeply involved in the industry-education integration in higher

vocational colleges ($\bar{X}=3.66$) and ($\bar{X}=3.60$), the government plays a good role in promoting the industry-education integration in higher vocational colleges ($\bar{X}=3.64$) and ($\bar{X}=3.79$), the government provides other support for the industry-education integration in higher vocational colleges ($\bar{X}=3.64$) and ($\bar{X}=3.54$), and the government provides sufficient financial support for the industry-education integration in higher vocational colleges ($\bar{X}=3.62$) and ($\bar{X}=3.74$). The results show that the opinions of students and teachers of vocational colleges in Guangdong Province on the government's performance in the development of industry-education integration are basically consistent.

Table 4.4 Mean and standard deviation of higher vocational colleges' performance in industry-education integration

Higher vocational colleges' performance in industry education integration	Students n=384, Teachers n=361							
	Students				Teachers			
	\bar{X}	S.D.	Level	Order	\bar{X}	S.D.	Level	Order
1. Higher vocational colleges have a positive attitude towards promoting industry-education integration	3.83	0.89	high	1	4.34	0.63	high	1
2. Higher vocational colleges have sufficient funds for industry-education integration	3.65	0.80	high	6	3.99	0.56	high	7
3. Higher vocational colleges have strong faculty in industry-education integration	3.78	0.82	high	3	4.13	0.67	high	3
4. Higher vocational colleges have perfect implementation plans for industry-education integration policies	3.72	0.77	high	5	4.03	0.63	high	6

Table 4.4 (Continued)

Higher vocational colleges' performance in industry education integration	Students n=384, Teachers n=361							
	Students				Teachers			
	\bar{X}	S.D.	Level	Order	\bar{X}	S.D.	Level	Order
5. Higher vocational colleges' industry-education integration courses or activities are in line with actual work needs	3.76	0.84	high	4	4.14	0.64	high	2
6. Higher vocational colleges have good results in cultivating talents for industry-education integration (professional settings, curriculum construction, internships and training, etc.)	3.82	0.82	high	2	4.04	0.52	high	5
7. Higher vocational colleges have good results in building a team of industry-education integration faculty (part-time teachers from enterprises, industry expert teachers, etc.)	3.72	0.78	high	5	4.06	0.65	high	4
8. Higher vocational colleges have good results in building industry-education integration platforms (industry colleges, internship and training bases, etc.)	3.78	0.85	high	3	4.06	0.63	high	4
Total	3.76	0.82	high		4.10	0.62	high	

According to Table 4.5, it is found that both students and teachers of higher vocational colleges in Guangdong Province believe that the performance of higher vocational colleges in the development of industry-education integration is at a high level ($\bar{X}=3.76$) and ($\bar{X}=4.10$). Students and teachers all agreed that the highest level was that higher vocational colleges had a positive attitude in promoting the industry-education integration ($\bar{X}=3.83$) and ($\bar{X}=4.34$), followed by several other aspects in which they were basically consistent, believing that higher vocational colleges had good results in cultivating talents for the industry-education integration (major setting, curriculum construction, internships and training, etc.) ($\bar{X}=3.82$) and ($\bar{X}=4.06$), that higher vocational colleges had strong faculty in the industry-education integration ($\bar{X}=3.78$) and ($\bar{X}=4.13$), that higher vocational colleges had good results in the construction of platforms for the industry-education integration (industry colleges, internship and training bases, etc.) ($\bar{X}=3.78$) and ($\bar{X}=4.06$), that higher vocational colleges' courses or activities for the industry-education integration were in line with actual work needs ($\bar{X}=3.76$) and ($\bar{X}=4.14$), that higher vocational colleges had perfect implementation plans for the industry-education integration policies ($\bar{X}=3.72$) and ($\bar{X}=4.03$), and that higher vocational colleges had good results in the construction of faculty teams for the industry-education integration (part-time teachers from enterprises, industry expert teachers, etc.) ($\bar{X}=3.72$), both believe that higher vocational colleges have sufficient capital investment in industry-education integration, and the lowest performance is ($\bar{X}=3.65$) and ($\bar{X}=3.99$). This result shows that the performance of higher vocational colleges in the development of industry-education integration is basically consistent among students and teachers.

Table 4.5 Mean and standard deviation of enterprise performance in industry-education integration.

Enterprises' performance in industry-education integration	Students n=384, Teachers n=361							
	Students				Teachers			
	\bar{X}	S.D.	Level	Order	\bar{X}	S.D.	Level	Order
1. Enterprises are deeply involved in industry-education integration projects	3.53	0.81	high	6	3.96	0.60	high	2
2. Enterprises have a positive attitude in promoting industry-education integration	3.66	0.80	high	3	3.93	0.55	high	4
3. Enterprises play an active role in student internships and employment in industry-education integration	3.72	0.79	high	1	4.10	0.60	high	1
4. Enterprises provide sufficient funds for industry-education integration	3.57	0.84	high	5	3.83	0.65	high	6
5. Enterprises provide sufficient human resources for industry-education integration	3.61	0.83	high	4	3.90	0.55	high	5
6. Enterprises provide sufficient equipment for industry-education integration	3.68	0.78	high	2	3.95	0.59	high	3
Total	3.63	0.81	high		3.95	0.59	high	

According to Table 4.5, it is found that both students and teachers of higher vocational colleges in Guangdong Province believe that the performance of enterprises in the development of industry-education integration is at a high level ($\bar{X}=3.63$) and ($\bar{X}=3.95$). Students and teachers agree that the highest level is that

enterprises have played a positive role in student internships and employment in industry-education integration ($\bar{X}=3.72$) and ($\bar{X}=4.10$), followed by their basically consistent views in several other aspects, that enterprises provide sufficient equipment for industry-education integration ($\bar{X}=3.68$) and ($\bar{X}=3.95$), that enterprises have a positive attitude in promoting industry-education integration ($\bar{X}=3.66$) and ($\bar{X}=3.93$), that enterprises provide sufficient human resources for industry-education integration ($\bar{X}=3.61$) and ($\bar{X}=3.90$), and that enterprises provide sufficient funds for industry-education integration ($\bar{X}=3.57$) and ($\bar{X}=3.83$). Students of higher vocational colleges in Guangdong Province believe that the lowest level is that enterprises are moderately deeply involved in industry-education integration projects ($\bar{X}=3.53$), while teachers of higher vocational colleges in Guangdong Province believe that this is the second highest level ($\bar{X}=3.96$). The results show that the perceptions of students and teachers in vocational colleges in Guangdong Province on the performance of enterprises in the development of industry-education integration are basically consistent, but there is also a problem deviation.

Table 4.6 Mean and standard deviation of students' performance in the industry-education integration in higher vocational colleges in Guangdong Province

Students n=384, Teachers n=361

Students' performance in industry-education integration	Students				Teachers			
	\bar{X}	S.D.	Level	Order	\bar{X}	S.D.	Level	Order
1. Industry-education integration is of great help to the study and future of higher vocational students	3.81	0.77	high	6	4.36	0.61	high	1
2. Industry-education integration can help higher vocational students better understand professional knowledge	3.87	0.77	high	3	4.14	0.50	high	4

Table 4.6 (Continued)

Students' performance in industry-education integration	Students n=384, Teachers n=361							
	Students				Teachers			
	\bar{X}	S.D.	Level	Order	\bar{X}	S.D.	Level	Order
3. Industry-education integration can help higher vocational students better understand the actual working environment	3.89	0.89	high	2	4.15	0.54	high	3
4. Industry-education integration can help higher vocational students better understand the job requirements of enterprises	3.94	0.88	high	1	4.17	0.51	high	2
5. Industry-education integration can significantly improve the employment competitiveness of higher vocational students	3.84	0.80	high	4	4.36	0.62	high	1
6. Students are willing to participate in activities of industry-education integration	3.82	0.82	high	5	4.06	0.55	high	5
Total	3.86	0.82	high		4.21	0.55	high	

According to Table 4.6, both students and teachers of higher vocational colleges in Guangdong Province believe that students' performance in developing industry-education integration is at a high level ($\bar{X}=3.86$) and ($\bar{X}=4.21$). However, there are differences in their highest level. Students of higher vocational colleges in Guangdong Province believe that the highest level is that industry-education integration can enable higher vocational students to understand the job requirements of enterprises better ($\bar{X}=3.94$). In comparison, teachers of higher vocational colleges in Guangdong Province believe that the highest level is that industry-education integration is of great help to the learning and future of higher

vocational students ($\bar{x}=4.36$) and that industry-education integration can significantly improve the employment competitiveness of higher vocational students ($\bar{x}=4.36$). Secondly, they also have differences in several other aspects. They believe that the industry-education integration can help higher vocational students better understand the actual working environment ($\bar{x}=3.89$) and ($\bar{x}=4.15$), that the industry-education integration can help higher vocational students better understand professional knowledge ($\bar{x}=3.87$) and ($\bar{x}=4.14$), that the industry-education integration can significantly improve the employment competitiveness of higher vocational students ($\bar{x}=3.84$) and ($\bar{x}=4.36$), and that students are willing to participate in the activities of the industry-education integration ($\bar{x}=3.82$) and ($\bar{x}=4.06$). In Guangdong Province, students of higher vocational colleges believe that the lowest level is the industry-education integration, which is of great help to the study and future of higher vocational students ($\bar{x}=3.81$), but teachers of higher vocational colleges in Guangdong Province believe that this is the highest level ($\bar{x}=4.36$), which fully shows that students and teachers of higher vocational colleges in Guangdong Province have serious deviations on the issue of students' performance in the development of the industry-education integration.

Interview record analysis

This study selected 7 education managers from 5 vocational colleges and 3 senior managers from 3 enterprises as interviewees, In order to find Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. Education managers must meet the following conditions: 1) have worked in the school for more than 10 years; 2) be responsible for school-enterprise cooperation, industry-education integration and other specific work; 3) must be willing to participate in structured interview recordings; 4) must be willing to review interview records for verification.

Senior enterprise managers must meet the following requirements: 1) Yheir enterprises are currently conducting school-enterprise cooperation with the vocational colleges; 2) have worked in the enterprise for more than 15 years; 3) Must be involved in the formulation of enterprise development policies; 4)Must be willing

to participate in structured interview recordings; 5) Must be willing to review interview records for verification. The list of interviewees is as follows:

Table 4.7 Interviewer details

interviewees	Workplace	Education and work background	Interview Date
Interviewee 1	Shenzhen Polytechnic	Name:Sun Bin Position: Deputy Director of Research Department Title:Associate Professor Education: Master Work experience: 19 years	August 9, 2024
Interviewee 2	Shenzhen Polytechnic	Name:Xu Hang Position: Director of Development Planning Department Title: Professor Education: PhD Work experience: 23 years	August 9, 2024
Interviewee 3	Guangdong Polytechnic of Light Industry	Name:Zhao Shuang Position: Vice Dean of School of Mechanical and Electrical Engineering Title:Professor Education: Master Work experience: 16 years	August 10, 2024
Interviewee 4	Heyuan Polytechnic	Name:Chen Yanfang Position: Deputy Director of Academic Affairs Office Title:Professor Education: Bachelor Work experience: 20 years	August 10, 2024

Table 4.7 (Continued)

interviewees	Workplace	Education and work background	Interview Date
Interviewee 5	Heyuan Polytechnic	Name:Liao Yuanbing Position: Director of Research Department Title:Professor Education: Master Work experience: 22 years	August 11, 2024
Interviewee 6	Shanwei Polytechnic	Name:Ye Feifei Position: Head of Practice Section of Academic Affairs Office Title:Associate Professor Education: Master Work experience: 15 years	August 11, 2024
Interviewee 7	Guangzhou Huali Polytechnic	Name:Li Peng Position: Director of Development Planning Department Title:Associate Professor Education: PhD Work experience: 24 years	August 12, 2024
Interviewee 8	Nongfu Spring Co., Ltd.	Name:Liu Ziqiang Position: Product Manager Title:Senior Engineer Education: Master Work experience: 17 years	August 12, 2024
Interviewee 9	Guangdong Yada Electronics Co., Ltd.	Name:Liu Shaobo Position: Marketing Manager Title:Senior Engineer Education: Bachelor Work experience: 19 years	August 12, 2024

Table 4.7 (Continued)

interviewees	Workplace	Education and work background	Interview Date
Interviewee 10	Minglai Laser Intelligent Equipment (Heyuan) Co., Ltd.	Name:Liu Cangling Position: Technical Manager Title:Engineer Education: College Work experience: 15 years	August 13, 2024

A total of 10 face-to-face interviews were conducted in this study. Each interview was conducted one-on-one in a more private place, where others could not eavesdrop on the conversation, ensuring that the interviewee would not be disturbed by other factors.

Interview conclusion analysis

The researchers classified, summarized, and sorted the suggestions of 10 interviewees on 4 questions. They agreed on many suggestions, and some were different, so we need to further analyze these suggestions. The interview suggestions are summarized in the following table:

Table 4.8 (Continued)

Questions	Suggestions	Interviewer 1	Interviewer 2	Interviewer 3	Interviewer 4	Interviewer 5	Interviewer 6	Interviewer 7	Interviewer 8	Interviewer 9	Interviewer 10	Percent
Question 2	10. With enterprises jointly apply for and develop projects				√				√			20.00
	11. Establish an evaluation and feedback mechanism			√					√			20.00
	12. Actively strive for government policies, financial support and publicity		√			√				√	√	40.00
Question 3	1. Participate in professional construction, curriculum development and talent training programs	√	√	√	√	√	√	√	√	√	√	90.00
	2. Co-build internship and training bases inside and outside the school	√		√	√	√	√		√	√	√	80.00
	3. Jointly apply for and develop projects			√	√	√	√		√	√		60.00
	4. Provide resources, equipment, technology and financial support	√	√	√	√		√	√	√	√	√	90.00
	5. Provide sufficient human resources (dispatch corporate mentors)	√	√		√	√	√		√	√	√	80.00
	6. Focus on policy trends and changes in market demand			√	√							20.00
	7. Build long-term cooperative relationships	√			√	√		√				40.00
	8. Provide sufficient internship and training opportunities		√	√	√		√		√	√	√	70.00
	9. Regularly hold lectures, seminars, corporate open days,	√	√								√	30.00

Table 4.8 (Continued)

Questions	Suggestions	Interviewer 1	Interviewer 2	Interviewer 3	Interviewer 4	Interviewer 5	Interviewer 6	Interviewer 7	Interviewer 8	Interviewer 9	Interviewer 10	Percent
Question 4	10.Encourage enterprises and higher vocational colleges to deeply participate in industry-education integration activities							√	√		√	30.00
	11.Improve relevant laws and regulations						√				√	20.00

SWOT-PEST analysis

During the interview, the interviewer provided a lot of strategies and suggestions. Based on the previous literature analysis and the interview results, the researcher used the SWOT-PEST analysis matrix to analyze the internal advantages, disadvantages, external opportunities, and threats of the industry-education integration in Guangdong vocational colleges from the political, economic, social, and technological aspects and constructed an analysis matrix of influencing factors. The analysis results are as follows:

Table 4.9 SWOT-PEST analysis table of the industry-education integration in Guangdong vocational colleges

PEST Factor		Politics (P)		Economy (E)		Society (S)		Technology (T)	
SWOT Factor									
Strengths (S)	SP1	The government attaches great importance to it and formulates a series of policies and regulations	SE1	The government provides financial support and provides funds and tax incentives	SS1	The government and higher vocational colleges are willing to strengthen the construction of the teaching staff	ST1	Higher vocational colleges optimize the curriculum system and talent training model	
	SP2	The government implements supervision and evaluation	SE2	Higher vocational colleges are willing to increase their capital investment	SS2	Enterprises are willing to provide sufficient human resources	ST2	Higher vocational colleges and enterprises are willing to jointly build internship and training bases inside and outside the school	
	SP3	The government and higher vocational colleges both support the establishment of an industry-education integration platform	SE3	Enterprises are willing to provide resources, equipment, technology and financial support	SS3	Students actively participate in internships and training, and industry-education integration activities	ST3		
					SS4	Established a coordination organization for industry-education integration and school-enterprise cooperation			

Table 4.9 (Continued)

PEST Factor SWOT Factor	Politics (P)	Economy (E)	Society (S)	Technology (T)
	Weaknesses (W)	WP1 Uneven regional economic development leads to uneven development of industry-education integration	WE1 Uneven economic development leads to uneven investment in industry-education integration	WS1 The communication mechanism between higher vocational enterprises is not smooth enough
WP2 The policies and regulations issued by the government are not perfect		WE2 The current global economic environment is in a downturn, and the government, higher vocational colleges, and enterprises are all facing insufficient funds.	WS2 The government, higher vocational colleges and enterprises have not established an industry-education integration feedback mechanism	WT2 The depth of enterprises and higher vocational colleges' participation in industry-education integration activities is insufficient
WP3 The government does not pay enough attention to the development of industry-education integration in higher vocational colleges			WS3 Higher vocational college students have weak independent learning ability, humanistic qualities, teamwork ability, and innovation and entrepreneurship ability	WT3 Higher vocational colleges are out of touch with enterprise needs and the curriculum setting is lagging behind

Table 4.9 (Continued)

PEST Factor SWOT Factor	Politics (P)	Economy (E)	Society (S)	Technology (T)
	Opportunities (O)	<p>OP1 The country is accelerating the layout of strategic emerging industries and vigorously supporting the industry-education integration in vocational education</p>	<p>OE1 Economic transformation and upgrading promotes the industry-education integration in vocational education</p> <p>OE2 The development of emerging industries provides opportunities for the industry-education integration</p>	<p>OS1 The salary level of professional and technical talents continues to increase, attracting more students from higher vocational colleges to participate in the industry-education integration activities</p> <p>OS2 The industry-education integration between enterprises and higher vocational colleges can bring real benefits to enterprises</p>

Table 4.9 (Continued)

PEST Factor SWOT Factor	Politics (P)	Economy (E)	Society (S)	Technology (T)
	Threats (T)	<p>TP1 Intensified geopolitical tensions and global economic instability pose challenges to the industry-education integration in vocational education</p>	<p>TE1 Economic downturn may lead to reduced investment in education, affecting the enthusiasm of governments, enterprises and higher vocational colleges for the industry-education integration</p>	<p>TS1 The decline in the birth rate and the lack of students in higher vocational colleges pose a threat to the industry-education integration</p>
<p>TP2 Changes in government policies affect the direction of industry-education integration</p>		<p>TE2 The rise of other regional economies has led to a brain drain, posing a challenge to the industry-education integration in higher vocational colleges in Guangdong Province</p>	<p>TS2 Social prejudices lead to low recognition of vocational education, affecting enthusiasm for the industry-education integration</p>	<p>TT2 International technological barriers affect the cultivation of talents in higher vocational education and hinder the industry-education integration</p> <p>TT3 Rapid technological updates lead to a disconnect between the industry-education integration courses and skills</p>

The second stage is to answer the Research objectives 2: formulate strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.

1. TOWS matrix analysis to formulate a draft strategy to improve the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.

Through a SWOT-PEST analysis of the questionnaire and interview results on the current status of industry-education integration development in higher vocational colleges in Guangdong Province, a draft strategy to improve the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province was proposed. These draft strategies are based on the results of the questionnaire survey and identify the measures with the lowest average scores in each variable. These suggestions are also supported by the interview results and relevant literature.

Table 4.10 TOWS matrix analysis

	External Opportunities	External Threats
	SO (Leverage Advantages to Seize Opportunities) Strategy:	ST (Strengths-Minimize-Threats) Strategy:
Internal Strengths	1. The government strengthens policy formulation and guidance, and implements supervision and evaluation mechanisms 2. The government and higher vocational colleges jointly establish an industry-education integration platform	1. The government should strengthen the stability and continuity of policies and ensure policy stability 2. The government, higher vocational colleges and enterprises should set up special funds for industry-education integration to ensure capital investment

Table 4.10 (Continued)

	External Opportunities	External Threats
Internal Strengths	3. The government and higher vocational colleges should jointly strengthen the construction of the teaching staff	3.The government should strengthen the publicity and promotion of vocational education and change the prejudice against vocational education
	4. The government provides financial support and tax incentives for higher vocational colleges and enterprises	4. Enterprises should participate in professional construction, curriculum development and talent training programs to ensure the consistency of industry-education integration courses and skills
	5. Higher vocational colleges and enterprises cooperate to build on-campus and off-campus internship and training bases	5. Enterprises should regularly hold lectures, seminars and corporate open days to allow more students from higher vocational colleges to participate in industry-education integration.
	6. Higher vocational colleges should increase their own capital investment	6. Students should pay attention to market demand and industry trends
	7. Higher vocational colleges should continuously optimize the curriculum system and talent training model	7. Students should actively obtain skills or professional qualification certificates
	8. Enterprises should strengthen resources, equipment, technology and financial support	
	9. Enterprises should provide sufficient human resources	
	10. Students actively participate in extracurricular practice, industry-education integration, innovation and entrepreneurship and other projects	

Table 4.10 (Continued)

	External Opportunities	External Threats
	<p>WO (Improve Weaknesses, Exploit Opportunities) Strategy:</p> <ol style="list-style-type: none"> 1. The government should vigorously support the development of industry-education integration in vocational education and increase the attention paid to the development of industry-education integration in higher vocational colleges 2. The government should continuously improve policies and regulations 	<p>WT (Reducing Weaknesses and Threats) Strategy:</p> <ol style="list-style-type: none"> 1. The government should promote vocational education reform and industrial resource upgrading and integration 2. Vocational colleges should strengthen the construction of teaching staff (hiring enterprise mentors, teachers to practice in enterprises, teacher training, etc.) Vocational colleges should jointly apply for and develop projects with enterprises 3. Enterprises should continue to pay attention to policy trends and market demand changes 4. Enterprises should provide students with sufficient internship and training opportunities 5. Students should strengthen communication and exchanges with enterprises 6. Students should continuously improve their professional skills and practical ability
Internal Weaknesses	<ol style="list-style-type: none"> 3. The government, higher vocational colleges and enterprises should establish a feedback mechanism for industry-education integration 4. The government should formulate an overall plan and implementation plan for industry-education integration 5. The government should encourage enterprises and higher vocational colleges to deeply participate in industry-education integration activities 	

Table 4.10 (Continued)

	External Opportunities	External Threats
Internal Weaknesses	6. Higher vocational colleges and enterprises should establish a smooth communication mechanism	7. Students should continuously strengthen their humanistic qualities, teamwork ability and innovation and entrepreneurship ability
	7. Higher vocational colleges and enterprises should establish long-term cooperative relations	
	8. Students should strengthen their independent learning ability	
	9. Vocational colleges should establish coordination agencies for industry-education integration and school-enterprise cooperation	

Through the above TOWS matrix analysis, combined with the experts' frequent strategic suggestions in the interview results, a draft strategy for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province was formed. As shown in the following table:

Table 4.11 Draft strategy for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province

Level	Draft strategy for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province
Government	<ol style="list-style-type: none"> 1. The government should strengthen the formulation and guidance of industry-education integration policies and implement supervision and evaluation mechanisms 2. The government and higher vocational colleges should jointly establish an industry-education integration platform 3. The government and higher vocational colleges should jointly strengthen the construction of the teaching staff 4. The government should provide financial support and tax incentives for higher vocational colleges and enterprises 5. The government should strengthen the publicity and promotion of vocational education and change the prejudice against vocational education 6. The government should strengthen the stability and continuity of policies 7. The government, higher vocational colleges and enterprises should set up special funds for industry-education integration to ensure capital investment 8. The government should continuously improve policies and regulations 9. The government, higher vocational colleges and enterprises should establish a feedback mechanism for industry-education integration 10. The government should encourage enterprises and higher vocational colleges to deeply participate in industry-education integration activities

Table 4.11 (Continued)

Level	Draft strategy for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province
Government	11. The government should formulate an overall plan and implementation plan for industry-education integration
Vocational colleges	<p>12. Higher vocational colleges should cooperate with enterprises to jointly build on-campus and off-campus internship and training bases</p> <p>13. Higher vocational colleges should strengthen the construction of the teaching staff (hiring enterprise mentors, teachers to practice in enterprises, teacher training, etc.)</p> <p>14. Higher vocational colleges should actively seek government policies, financial support and publicity on industry-education integration</p> <p>15. Vocational colleges should increase their own investment in the industry-education integration</p> <p>16. Vocational colleges should continuously optimize the curriculum system and talent training model (professional setting, curriculum construction, internships and training, development of teaching materials, etc.)</p> <p>17. Vocational colleges and enterprises should establish a smooth communication mechanism</p> <p>18. Vocational colleges should establish long-term cooperative relations with enterprises</p> <p>19. Vocational colleges should jointly apply for and develop projects with enterprises</p>
Enterprises	<p>20. Enterprises should participate in the construction of internship and training bases on and off campus of vocational colleges</p> <p>21. Enterprises should establish long-term cooperative relations with vocational colleges</p>

Table 4.11 (Continued)

Level	Draft strategy for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province
Enterprises	22. Enterprises The industry should strengthen resources, equipment, technology and financial support
	23. Enterprises should provide sufficient human resources to higher vocational colleges to become enterprise mentors
	24. Enterprises should participate in the professional construction, curriculum development and talent training programs of higher vocational colleges
	25. Enterprises should set up special funds for industry-education integration to ensure capital investment
	26. Enterprises should participate in professional construction, curriculum development and talent training programs to ensure the consistency of industry-education integration courses and skills
	27. Enterprises should regularly hold lectures, seminars, and enterprise open days to allow more students from higher vocational colleges to participate in industry-education integration
	28. Enterprises should continue to pay attention to policy dynamics and changes in market demand
	29. Enterprises should provide students with sufficient internship and training opportunities
	Students
31. Students should actively participate in internship and training activities	
32. Students should strengthen communication and exchanges with enterprises	
33. Students should pay attention to market demand and industry dynamics	

Table 4.11 (Continued)

Level	Draft strategy for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province
Students	34. Students should actively obtain skills or professional qualification certificates
	35. Students should strengthen their independent learning ability
	36. Students should continuously improve their professional skills and practical ability
	37. Students should continuously strengthen their humanistic qualities, teamwork ability and innovation and entrepreneurship ability

2. Strategy draft evaluation, forming a sustainable development strategy for industry-education integration in higher vocational colleges in Guangdong Province

25 experts from 5 higher vocational colleges in Guangdong Province were invited to participate in the strategy evaluation on sustainable development strategy of the industry-education integration in higher vocational colleges in Guangdong Province. The group is composed of senior education experts, full-time teachers and senior leaders. Details are as follows.

Among them, educational management personnel must meet the following conditions: 1) must be responsible for the school-enterprise cooperation, industry-education integration and other specific work; 2) have worked in the school for more than 15 years in colleges;

Table 4.12 Expert table for strategy draft evaluation

Experts	Workplace	Education and work background
Expert 1	Shenzhen Polytechnic	Position: Deputy Director of the Research Department Title: Associate Professor Education: Master Years of working experience: 19 years
Expert 2	Shenzhen Polytechnic	Position: Director of Development Planning Department Title: Professor Education: PhD Years of experience: 23 years
Expert 3	Shenzhen Polytechnic	Position: Director of the School-Enterprise Office of the School of Electronic Information Title: Associate Professor Education: Master Years of working experience: 15 years
Expert 4	Shenzhen Polytechnic	Position: Vice Dean of School of Electronic Information Title: Professor Education: PhD Years of experience: 24 years
Expert 5	Shenzhen Polytechnic	Position: Director of the Teaching Section of the Academic Affairs Office Title: Associate Professor Education: Master Years of working experience: 16 years
Expert 6	Guangdong Polytechnic of Light Industry	Position: Vice Dean of the School of Mechanical and Electrical Engineering Title: Professor Education: Master Years of working experience: 16 years

Table 4.12 (Continued)

Experts	Workplace	Education and work background
Expert 6	Guangdong Polytechnic of Light Industry	Position: Vice Dean of the School of Mechanical and Electrical Engineering Title: Professor Education: Master Years of working experience: 16 years
Expert 7	Guangdong Polytechnic of Light Industry	Position: Deputy Director of Development Planning Division Title: Professor Education: PhD Years of working experience: 18 years
Expert 8	Guangdong Polytechnic of Light Industry	Position: Director of the School-Enterprise Office of the School of Mechanical and Electrical Engineering Title: Associate Professor Education: Master Years of working experience: 16 years
Expert 9	Guangdong Polytechnic of Light Industry	Position: Deputy Director of the Academic Affairs Office Title: Professor Education: PhD Years of experience: 23 years
Expert 10	Guangdong Polytechnic of Light Industry	Position: Director of Research Department Title: Associate Professor Education: PhD Years of working experience: 16 years
Expert 11	Guangdong Polytechnic of Light Industry	Position: Deputy Director of the Academic Affairs Office Title: Professor Education: Bachelor degree Working experience: 20 years

Table 4.12 (Continued)

Experts	Workplace	Education and work background
Expert 12	Heyuan Polytechnic	Position: Director of Research Department Title: Professor Education: Master Years of work experience: 22 years
Expert 13	Heyuan Polytechnic	Position: Deputy Director of the Academic Affairs Office Title: Associate Professor Education: Postgraduate Years of experience: 23 years
Expert 14	Heyuan Polytechnic	Position: Director of the School-Enterprise Office of the School of Telecommunications Title: Professor Education: PhD Working experience: 20 years
Expert 15	Heyuan Polytechnic	Position: Vice Dean of School of Telecommunications Title: Associate Professor Education: Bachelor degree Years of work experience: 22 years
Expert 16	Heyuan Polytechnic	Position: Director of the Practice Section of the Academic Affairs Office Title: Associate Professor Education: Master Years of work experience: 15
Expert 17	Shanwei Polytechnic	Position: Director of the Teaching Section of the Academic Affairs Office Title: Associate Professor Education: Master Years of working experience: 15 years

Table 4.12 (Continued)

Experts	Workplace	Education and work background
Expert 18	Shanwei Polytechnic	Position: Head of the School-Enterprise Cooperation Section of the Research Department Title: Associate Professor Education: Postgraduate Years of working experience: 16 years
Expert 19	Shanwei Polytechnic	Position: Director of the School-Enterprise Office of the School of Arts Title: Professor Education: PhD Working experience: 20 years
Expert 20	Shanwei Polytechnic	Position: Vice Dean of School of Management Title: Associate Professor Education: Master Years of working experience: 17 years
Expert 21	Shanwei Polytechnic	Position: Director of Development Planning Department Title: Associate Professor Education: PhD Years of experience: 24 years
Expert 22	Shanwei Polytechnic	Position: Deputy Director of Personnel Department Title: Associate Professor Education: Postgraduate Years of working experience: 19 years
Expert 23	Guangzhou Huali Polytechnic	Position: Director of the School-Enterprise Office of the School of Nursing Title: Professor Education: PhD Working experience: 20 years

Table 4.12 (Continued)

Experts	Workplace	Education and work background
Expert 24	Guangzhou Huali Polytechnic	Position: Vice Dean of School of Management Title: Associate Professor Education: PhD Years of working experience: 18 years
Expert 25	Guangzhou Huali Polytechnic	Position: Deputy Director of the Research Department Title: Associate Professor Education: Postgraduate Years of working experience: 21 years

The evaluation of the draft strategy by the strategic evaluation experts is mainly divided into four aspects, including government-level strategy (1-11), vocational college-level strategy (12-19), enterprise-level strategy (20-29), and student-level policy (30-37). After the strategic evaluation experts evaluate the draft strategy item by item and supplement the strategic suggestions from the four levels of government, vocational colleges, enterprises, and students, the draft strategy with a percentage of approval exceeding 50% will be adopted and finally formed into a strategy.

Table 4.13 Evaluation and analysis of the draft strategy by evaluation experts at the government level

Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Expert 11	Expert 12	Expert 13	Expert 14	Expert 15	Expert 16	Expert 17	Expert 18	Expert 19	Expert 20	Expert 21	Expert 22	Expert 23	Expert 24	Expert 25	frequency	percentage
1. The government strengthens policy formulation and guidance for industry-education integration, and implements supervision and evaluation mechanisms																										
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	25	100.00
2. The government and higher vocational colleges jointly establish an industry-education integration platform																										
√	√	√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	24	96.00
3. The government and higher vocational colleges should jointly strengthen the construction of teaching staff																										
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	25	100.00
4. The government should provide financial support and tax incentives for higher vocational colleges and enterprises																										
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	25	100.00
5. The government should strengthen the publicity and promotion of vocational education and change the prejudice against vocational education.																										
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		√	√	√	√	√		23	92.00

Table 4.13 (Continued)

Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Expert 11	Expert 12	Expert 13	Expert 14	Expert 15	Expert 16	Expert 17	Expert 18	Expert 19	Expert 20	Expert 21	Expert 22	Expert 23	Expert 24	Expert 25	frequency	percentage
6. The government should strengthen the stability and continuity of policies																										
	√		√	√			√	√		√			√			√		√	√			√		√	12	48.00
7. The government, higher vocational colleges and enterprises should set up special funds for industry-education integration to ensure capital investment																										
√	√	√	√	√	√		√	√	√			√	√		√	√		√	√	√	√	√		√	18	72.00
8. The government should continue to improve policies and regulations																										
	√	√	√		√	√	√		√	√	√	√	√		√		√		√		√	√	√	√	18	72.00
9. The government, higher vocational colleges and enterprises should establish a feedback mechanism for industry-education integration																										
√	√		√	√	√	√	√		√	√		√	√	√			√		√		√		√	√	16	64.00

Table 4.13 (Continued)

Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Expert 11	Expert 12	Expert 13	Expert 14	Expert 15	Expert 16	Expert 17	Expert 18	Expert 19	Expert 20	Expert 21	Expert 22	Expert 23	Expert 24	Expert 25	frequency	percentage	
10. The government should encourage enterprises and higher vocational colleges to deeply participate in the industry-education integration																											
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	25	100.00
11. The government should formulate an overall plan and implementation plan for the industry-education integration																											
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	25	100.00
Evaluate the expert advice on the draft government-level strategy																											
Similar policy and regulatory measures (1, 8, 9), funding measures (4, 7), program development mechanisms (2, 11) and publicity (5, 10) should be integrated and merged.																											

According to the evaluation experts' evaluation and analysis of the draft strategy at the government level, the percentage of approval for the sixth measure (the government should strengthen the stability and continuity of policies) is 48%, which proves that this measure will not be adopted and should be deleted. The percentage of approval for the remaining measures is more than 50%, and they are all adopted. According to the evaluation experts' suggestions on the draft strategy at the government level, similar policies and regulations (1, 8, 9) measures, capital investment (4, 7) measures, program formulation mechanisms (2, 11) and publicity (5, 10) are merged, and the government-level strategy for sustainable development of the industry-education integration in higher vocational colleges in Guangdong Province is as follows:

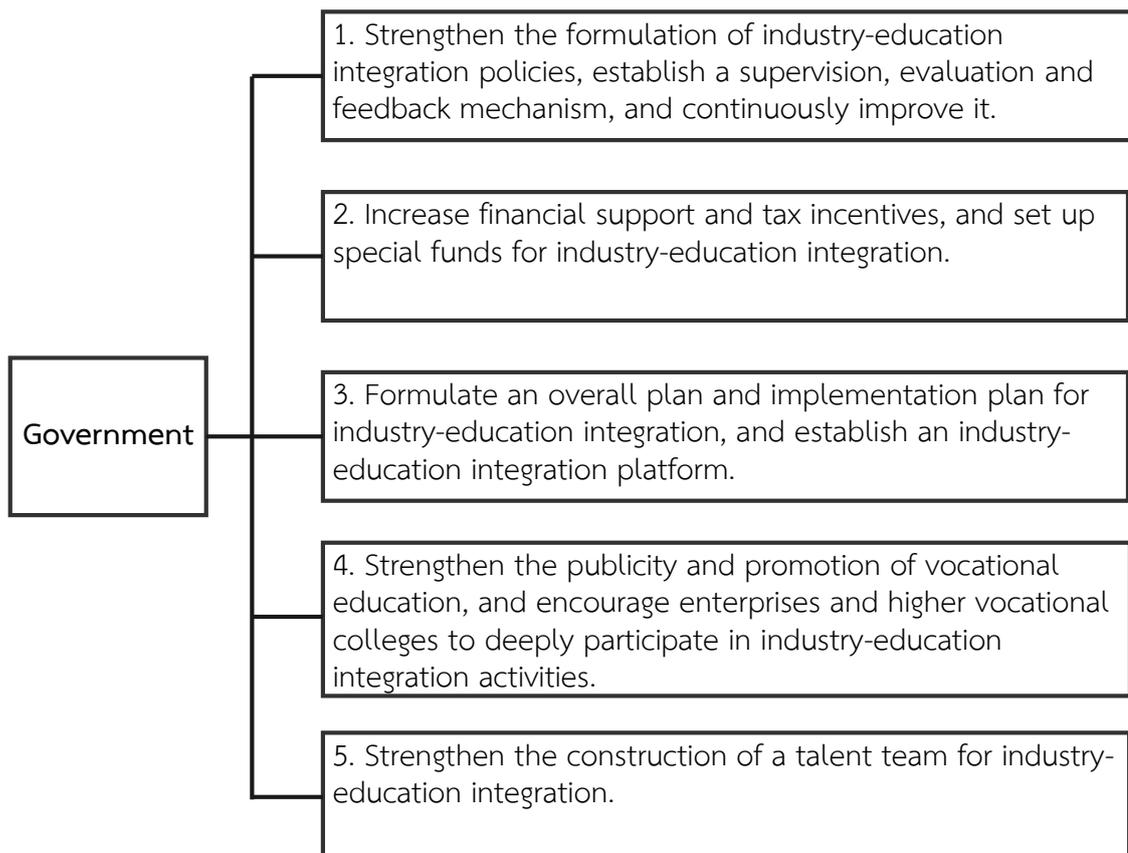


Figure 4.1 Government level - Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province

Table 4.14 Evaluation and analysis of the draft strategy by evaluation experts at the vocational college level

Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Expert 11	Expert 12	Expert 13	Expert 14	Expert 15	Expert 16	Expert 17	Expert 18	Expert 19	Expert 20	Expert 21	Expert 22	Expert 23	Expert 24	Expert 25	frequency	percentage	
12. Vocational colleges should cooperate with enterprises to build on-campus and off-campus internship and training bases																											
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	25	100.00
13. Vocational colleges should strengthen the construction of teaching staff (hiring enterprise mentors, teachers to practice in enterprises, teacher training, etc.)																											
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	25	100.00
14. Vocational colleges should actively seek government policies, financial support and publicity on industry-education integration																											
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	25	100.00
15. Vocational colleges should increase their investment in industry-education integration																											
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	25	100.00
16. Vocational colleges should continuously optimize the curriculum system and talent training model (professional setting, curriculum construction, internship training, development of teaching materials, etc.)																											
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	25	100.00
17. Vocational colleges and enterprises should establish long-term cooperative relations																											
√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√		√	√	√	√	√	√	√	√	23	92.00

Table 4.14 (Continued)

Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Expert 11	Expert 12	Expert 13	Expert 14	Expert 15	Expert 16	Expert 17	Expert 18	Expert 19	Expert 20	Expert 21	Expert 22	Expert 23	Expert 24	Expert 25	frequency	percentage	
18. Vocational colleges and enterprises should maintain a smooth communication mechanism																											
√	√	√	√	√	√			√	√		√	√	√	√	√		√	√	√	√	√	√	√	√	√	20	80.00
19. Vocational colleges should establish coordination agencies for industry-education integration and school-enterprise cooperation																											
√	√	√			√	√	√	√	√		√	√	√	√			√		√	√	√	√	√	√	√	19	76.00
20. Vocational colleges should jointly apply for and develop projects with enterprises																											
√	√	√	√	√		√	√	√		√	√	√	√	√	√		√	√	√	√			√	√		20	80.00
Evaluation experts' suggestions on the draft strategy for higher vocational colleges																											
Similar measures such as cooperation with enterprises (12, 17, 18, 20) and capital investment (14, 15) should be integrated and combined.																											

According to the evaluation experts' evaluation and analysis of the draft strategy at the higher vocational college level, it can be concluded that all measures in the draft strategy have a percentage of approval exceeding 50% and are all adopted. According to the evaluation experts' suggestions on the draft strategy at the higher vocational college level, similar measures such as cooperation with enterprises (12, 17, 18, 20) and capital investment (14, 15) should be integrated and merged. The strategies for sustainable development of the industry-education integration in higher vocational colleges in Guangdong Province at the higher vocational college level are as follows:

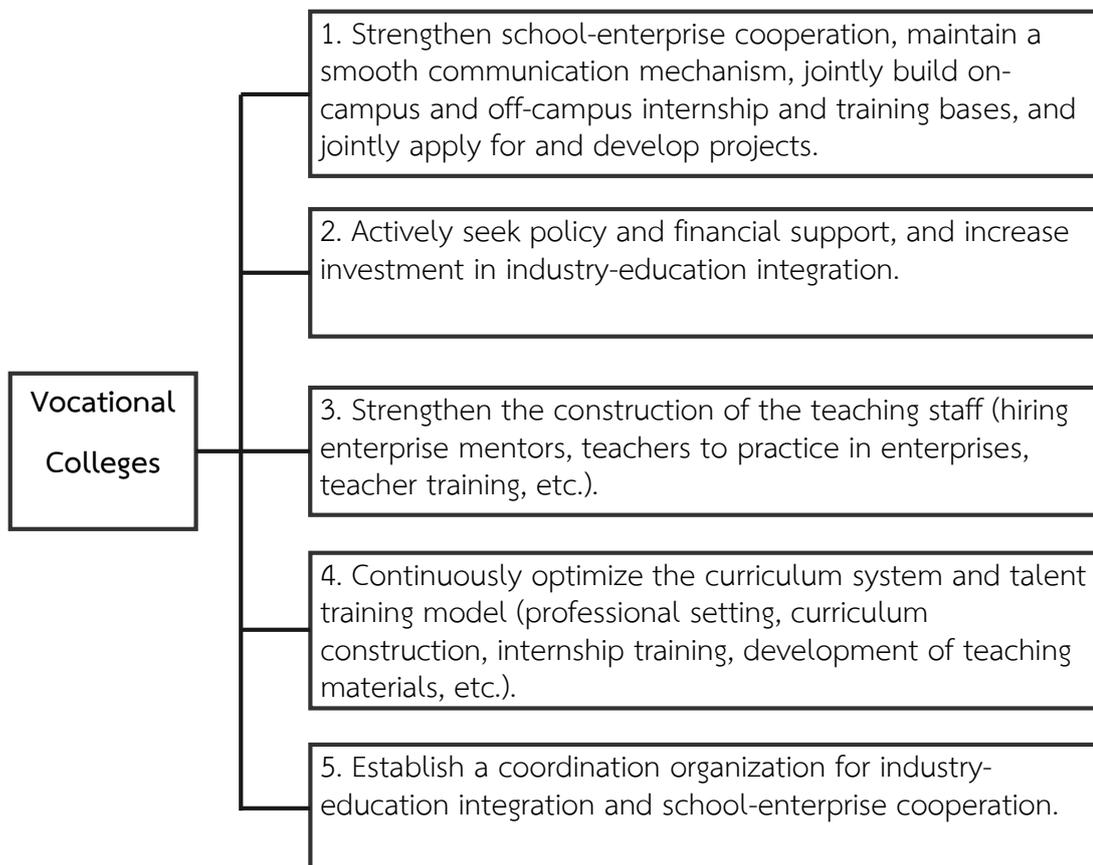


Figure 4.2 Vocational college level - Strategies for sustainable development of industry-education integration in vocational colleges in Guangdong

Table 4.1 Evaluation and analysis of the draft strategy by evaluation experts at the enterprise level

Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Expert 11	Expert 12	Expert 13	Expert 14	Expert 15	Expert 16	Expert 17	Expert 18	Expert 19	Expert 20	Expert 21	Expert 22	Expert 23	Expert 24	Expert 25	frequency	percentage	
21. Enterprises should participate in the construction of on-campus and off-campus internship and training bases for higher vocational colleges																											
√	√	√	√	√	√	√	√		√	√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	23	92.00
22. Enterprises should establish long-term cooperative relations with higher vocational colleges																											
	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		√	23	92.00
23. Enterprises should strengthen resources, equipment, technology and financial support																											
√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	24	96.00
24. Enterprises should provide sufficient human resources to serve as enterprise mentors in higher vocational colleges																											
√	√		√	√	√	√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	23	92.00

Table 4.2 (Continued)

Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Expert 11	Expert 12	Expert 13	Expert 14	Expert 15	Expert 16	Expert 17	Expert 18	Expert 19	Expert 20	Expert 21	Expert 22	Expert 23	Expert 24	Expert 25	frequency	percentage	
25. Enterprises should set up special funds for industry-education integration to ensure capital investment																											
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	25	100.00
26. Enterprises should participate in the professional construction, curriculum development and talent training programs of higher vocational colleges to ensure the consistency of industry-education integration courses and skills.																											
√	√		√	√	√	√	√	√	√	√		√	√	√	√	√	√		√	√	√	√	√			21	84.00
27. Enterprises should regularly hold lectures, seminars, and open days to allow more students from higher vocational colleges to participate in the industry-education integration.																											
			√	√	√	√	√		√	√	√	√		√	√		√		√	√	√	√		√	√	18	72.00
28. Enterprises should continue to pay attention to policy trends and changes in market demand																											
	√	√	√	√			√	√		√	√		√	√	√	√		√	√	√		√	√	√		18	72.00

Table 4.15 (Continued)

Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Expert 11	Expert 12	Expert 13	Expert 14	Expert 15	Expert 16	Expert 17	Expert 18	Expert 19	Expert 20	Expert 21	Expert 22	Expert 23	Expert 24	Expert 25	frequency	percentage
29. Enterprises should provide students with sufficient internship and training opportunities																										
√	√	√	√	√		√	√	√		√	√	√	√		√	√	√	√		√	√		√	√	20	80.00
Evaluation of expert advice on draft corporate-level strategies																										
Similar measures such as participation in industry-education integration activities in higher vocational colleges (21, 22, 26), financial investment (23, 25), and providing students with industry-education integration activities (27, 29) should be integrated and merged.																										

According to the evaluation experts' analysis of the draft strategy at the enterprise level, all measures in the draft strategy have a percentage of approval exceeding 50% and are adopted. According to the evaluation experts' suggestions on the draft strategy at the enterprise level, similar measures such as participating in the industry-education integration activities of higher vocational colleges (21, 22, 26), capital investment (23, 25) and providing students with industry-education integration activities (27, 29) should be integrated and merged. The enterprise-level strategy for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province is as follows:

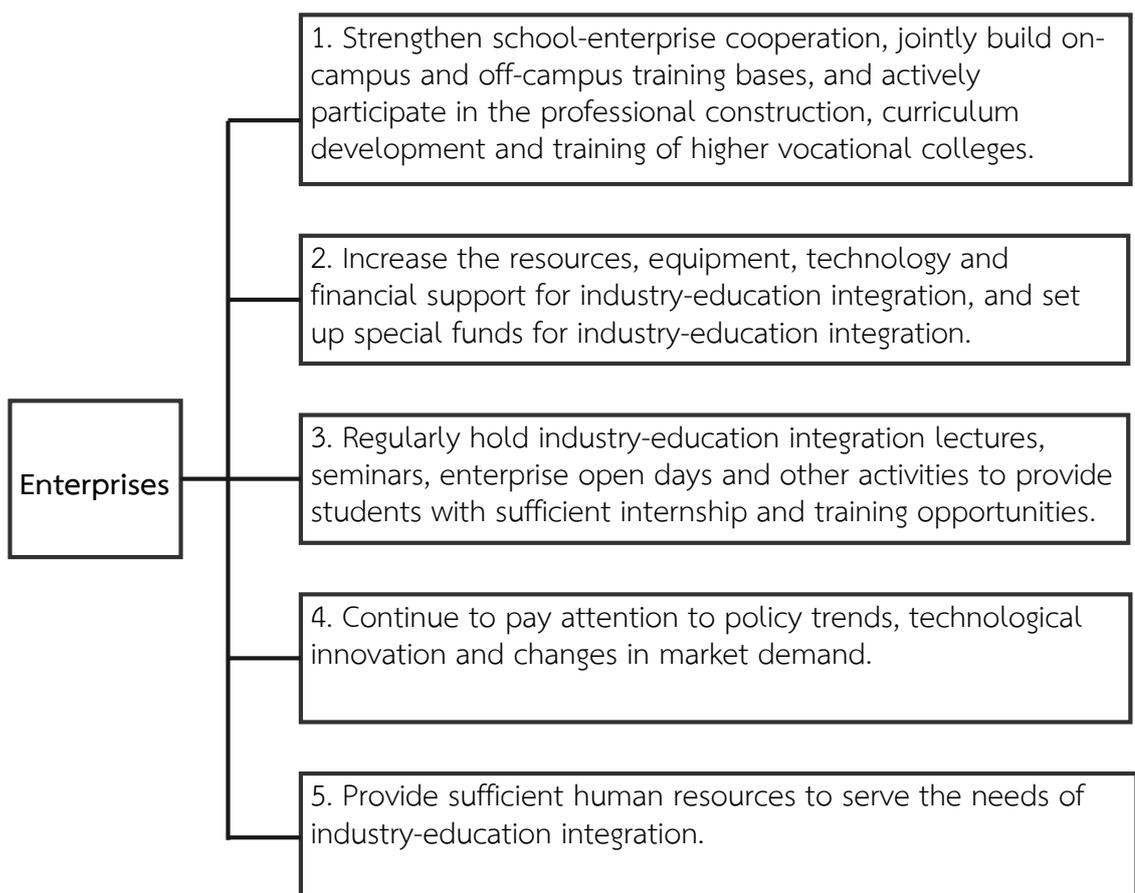


Figure 4.2 Enterprise level - Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province

Table 4.16 Evaluation analysis of the draft strategy by evaluation experts - student level

Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Expert 11	Expert 12	Expert 13	Expert 14	Expert 15	Expert 16	Expert 17	Expert 18	Expert 19	Expert 20	Expert 21	Expert 22	Expert 23	Expert 24	Expert 25	frequency	percentage	
30. Students should actively participate in extracurricular practice, innovation and entrepreneurship projects																											
√	√	√	√	√	√	√	√	√	√	√		√	√	√	√	√		√	√	√	√	√	√	√	√	23	92.00
31. Students should actively participate in internships and other activities																											
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	25	100.00
32. Students should strengthen communication and exchanges with enterprises																											
√	√	√	√	√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√		23	92.00
33. Students should pay attention to market demand and industry trends																											
		√	√	√	√		√	√	√		√	√	√		√	√	√	√		√	√	√	√	√		19	76.00
34. Students should actively acquire skills or professional qualifications																											
√	√		√	√	√	√	√	√		√	√	√	√	√	√		√	√	√	√	√		√	√		21	84.00
35. Students should strengthen their independent learning ability																											
√	√		√	√	√	√	√	√		√	√	√		√	√	√	√	√	√		√	√	√	√		21	84.00

Table 4.16 (Continued)

Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Expert 11	Expert 12	Expert 13	Expert 14	Expert 15	Expert 16	Expert 17	Expert 18	Expert 19	Expert 20	Expert 21	Expert 22	Expert 23	Expert 24	Expert 25	frequency	percentage	
36. Students should continuously improve their professional skills and practical abilities																											
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	25	100.00
37. Students should continuously improve their humanistic qualities, teamwork skills, and innovative entrepreneurial abilities																											
√	√	√	√			√	√	√	√		√	√	√	√		√		√	√	√	√		√	√	19	76.00	
Evaluated experts ' advice on draft student-level strategies																											
Similar measures such as participating in industry-education integration activities in higher vocational colleges (30, 31), strengthening ties with enterprises (32, 33), improving skills (34, 36) and enhancing personal abilities (35, 36, 37) should be integrated and combined.																											

According to the evaluation experts' analysis of the draft strategy - student level, it can be found that all measures in the draft strategy have a percentage of approval of more than 50% and are all adopted. According to the evaluation experts' suggestions on the draft strategy at the student level, similar measures such as participating in the industry-education integration activities of higher vocational colleges (30, 31), strengthening ties with enterprises (32, 33), improving skills (34, 36) and improving personal abilities (35, 36, 37) should be integrated and merged. The following are the strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province at the student level :

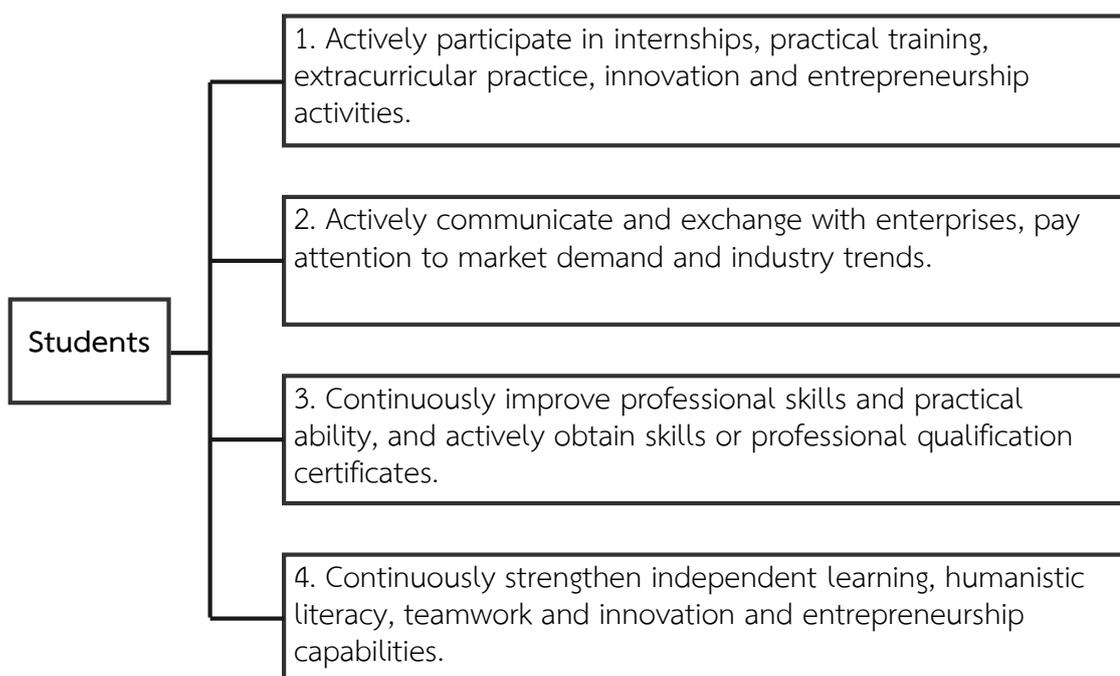


Figure 4.4 Student level - Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province

After evaluation by the draft strategy evaluation experts and additional suggestions, the final strategy is as follows:

Table 4.17 Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province

Strategy	Specific measures
Government-level strategies	<ol style="list-style-type: none"> 1. Strengthen the formulation of industry-education integration policies, establish supervision, evaluation, and feedback mechanisms, and continuously improve them. 2. Increase financial support and tax incentives and establish special funds for industry-education integration. 3. Formulate an overall plan and implementation plan for the industry-education integration and establish an industry-education integration platform. 4. Strengthen the publicity and promotion of vocational education and encourage enterprises and higher vocational colleges to participate deeply in industry-education integration activities. 5. Strengthen the construction of talent team integrating Industry-Education.
Strategies at the vocational college level	<ol style="list-style-type: none"> 1. Strengthen school-enterprise cooperation, maintain a smooth communication mechanism, jointly build on-campus and off-campus internship and training bases, and jointly apply for and develop projects. 2. Actively seek policy and financial support and increase investment in industry-education integration. 3. Strengthen the construction of the teaching staff (hiring enterprise mentors, teachers to practice in enterprises, teacher training, etc.).

Table 4.17 (Continued)

Strategy	Specific measures
Strategies at the vocational college level	<p>4. Continuously optimize the curriculum system and talent training model (professional setting, curriculum construction, internship training, teaching material development, etc.).</p> <p>5. Establish a coordination organization for industry-education integration and school-enterprise cooperation.</p>
Enterprise-level strategy	<p>1. Strengthen school-enterprise cooperation, jointly build on-campus and off-campus training bases, and actively participate in higher vocational colleges' professional construction, curriculum development, and personnel training.</p> <p>2. Increase resources, equipment, technology, and financial support for industry-education integration and establish special funds for it.</p> <p>3. Regularly hold industry-education integration lectures, seminars, company open days, and other activities to provide students with sufficient internship and training opportunities.</p> <p>4. Continue to pay attention to policy trends, technological innovations, and changes in market demand.</p> <p>5. Provide sufficient human resources to meet the needs of industry-education integration.</p>
Student-level strategies	<p>1. Actively participate in internships, practical training, extracurricular practice, innovation and entrepreneurship, and other activities.</p> <p>2. Actively communicate and exchange with enterprises and pay attention to market demand and industry trends.</p> <p>3. Continuously improve professional skills and practical abilities and actively obtain skills or professional qualification certificates.</p> <p>4. Continuously strengthen independent learning, humanistic qualities, teamwork, innovation, and entrepreneurship capabilities.</p>

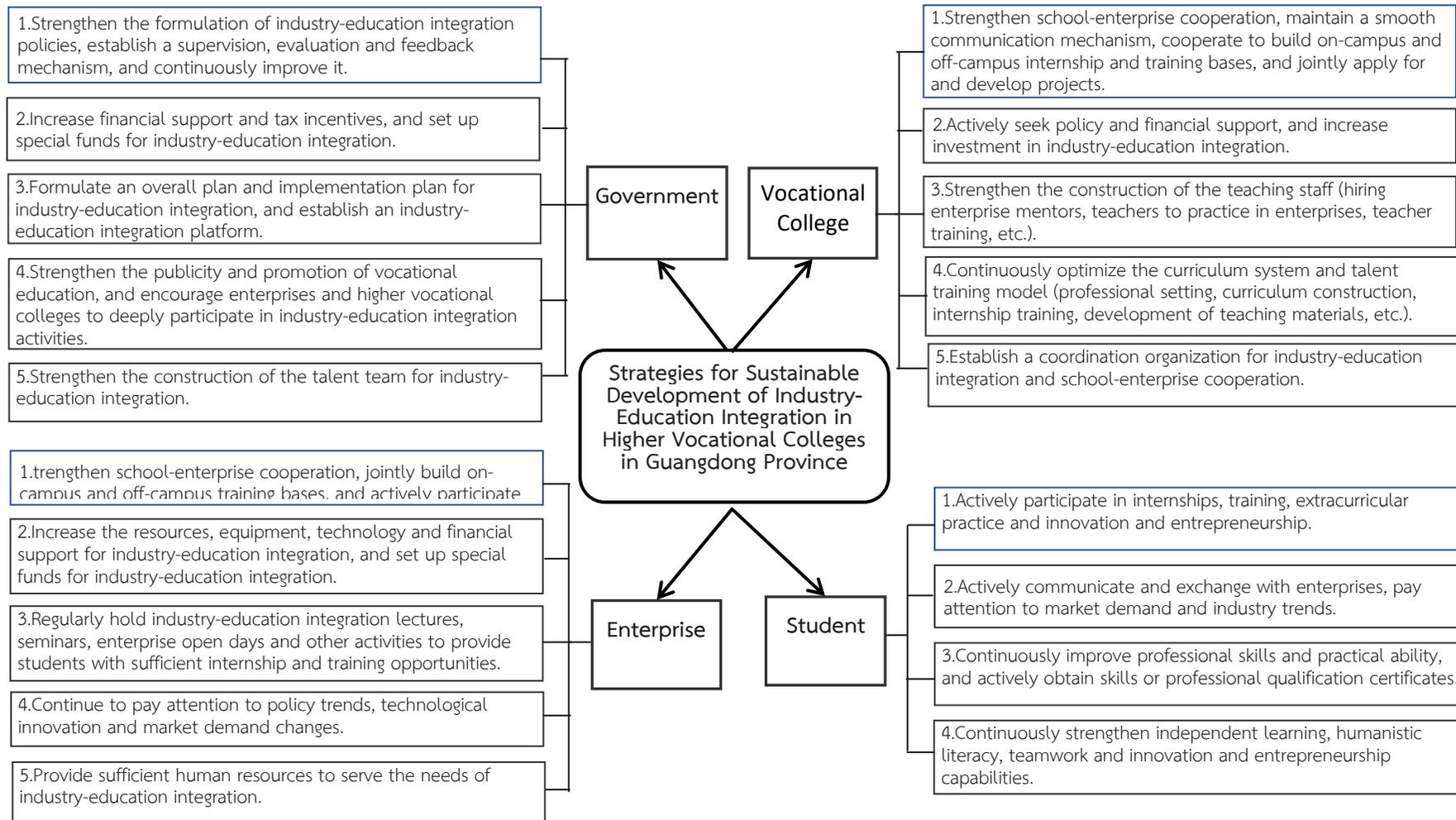


Figure 4.5 Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province

The third stage is to answer research objectives 3: Evaluate the suitability and feasibility of strategies for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.

Experts evaluate the suitability and feasibility of strategies

25 experts from 5 higher vocational colleges in Guangdong Province were invited to evaluate the suitability and feasibility of the strategy to improve the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. The group comprises senior education experts, full-time teachers, and senior leaders. Among them, educational administrators must meet the following conditions: 1) must be responsible for school-enterprise cooperation, industry-education integration, etc.; 2) have worked in the college for more than 15 years. Details are shown in Table 4.12.

There are 4 aspects and 19 measures in the strategy to improve the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. All scales use the Likert 5 scale, with a maximum value of 5 and a minimum of 1. The data interpretation of the mean value is based on Rensis Likert (1932): 4.50-5.00 represents the highest level, 3.50-4.49 represents a high level, 2.50-3.49 represents a medium level, 1.50-2.49 represents a low level, and 1.00-1.49 represents the lowest level.

Based on the expert evaluation results, this paper analyzes the mean and standard deviation strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province from four aspects: 1) government-level strategy, 2) higher vocational college-level strategy, 3) enterprise-level strategy, and 4) student-level strategy. The evaluation results are as follows:

Table 4.18 Mean and standard deviation strategies for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province

Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province	Suitability			Feasibility		
	\bar{X}	S.D.	Level	\bar{X}	S.D.	Level
1. Strategies at the government level	4.70	0.50	highest	4.50	0.51	highest
2. Strategies at the higher vocational college level	4.75	0.43	highest	4.68	0.52	highest
3. Strategies at the enterprise level	4.68	0.47	highest	4.31	0.57	high
4. Strategies at the student level	4.59	0.49	highest	4.56	0.52	highest
Total	4.68	0.47	highest	4.51	0.53	highest

According to Table 4.18, the strategy evaluation experts believe that the overall feasibility and suitability strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province are at the highest level, which are ($\bar{X}=4.51$) and ($\bar{X}=4.68$), respectively. However, the strategy evaluation experts believe that the feasibility of the enterprise-level strategy is at a high level ($\bar{X}=4.31$), and the rest are at the highest level.

Table 4.19 Mean and standard deviation strategies for sustainable development of industry-education integration in higher vocational colleges in the Guangdong Province-government level

Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province-Government-level strategies	Suitability			Feasibility		
	\bar{X}	S.D.	Level	\bar{X}	S.D.	Level
	1. Strengthen the formulation of industry-education integration policies, establish supervision, evaluation, and feedback mechanisms, and continuously improve them.	4.76	0.44	highest	4.64	0.49
2. Increase financial support and tax incentives and establish special funds for industry-education integration.	4.72	0.46	highest	4.36	0.57	high
3. Formulate an overall plan and implementation plan for industry-education integration and establish an industry-education integration platform.	4.72	0.54	highest	4.32	0.48	high
4. Strengthen the publicity and promotion of vocational education and encourage enterprises and higher vocational colleges to participate deeply in industry-education integration activities.	4.64	0.57	highest	4.64	0.49	highest
5. Strengthen the construction of talent team integrating Industry-Education.	4.68	0.48	highest	4.52	0.51	highest
Total	4.70	0.50	highest	4.50	0.51	highest

According to Table 4.19, it is found that the strategy evaluation experts believe that the overall feasibility and suitability of the strategy for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province - the government-level strategy are at the highest level, respectively ($\bar{x}=4.50$) and ($\bar{x}=4.70$). However, the feasibility of the two measures of "increasing financial support and tax incentives, setting up special funds for industry-education integration" and "formulating an overall plan and implementation plan for industry-education integration, and establishing an industry-education integration platform" is considered to be at a high level, respectively ($\bar{x}=4.36$) and ($\bar{x}=4.32$). The rest are at the highest level.

Table 4.20 Mean and standard deviation of the strategy for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province - higher vocational college level

Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province-Higher vocational college-level Strategies	Suitability			Feasibility		
	\bar{x}	S.D.	Level	\bar{x}	S.D.	Level
1. Strengthen school-enterprise cooperation, maintain a smooth communication mechanism, jointly build on-campus and off-campus internship and training bases, and jointly apply for and develop projects.	4.80	0.41	highest	4.76	0.44	highest
2. Actively seek policy and financial support and increase investment in industry-education integration.	4.64	0.49	highest	4.44	0.71	high

Table 4.20 (Continued)

Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province-Higher vocational college-level Strategies	Suitability			Feasibility		
	\bar{X}	S.D.	Level	\bar{X}	S.D.	Level
3. Strengthen the construction of the teaching staff (hiring enterprise mentors, teachers to practice in enterprises, teacher training, etc.).	4.84	0.37	highest	4.76	0.44	highest
4. Continuously optimize the curriculum system and talent training model (professional setting, curriculum construction, internship training, teaching material development, etc.).	4.76	0.44	highest	4.76	0.44	highest
5. Establish a coordination organization for industry-education integration and school-enterprise cooperation.	4.72	0.46	highest	4.68	0.56	highest
Total	4.75	0.43	highest	4.68	0.52	highest

According to Table 4.20, it is found that the strategy evaluation experts believe that the overall feasibility and suitability of the strategy for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province - the strategy at the higher vocational college level are at the highest level, respectively ($\bar{X}=4.68$) and ($\bar{X}=4.75$). However, the feasibility of the measure of "actively seeking policy and financial support and increasing investment in industry-education integration" is considered to be at a high level ($\bar{X}=4.44$), and the rest are at the highest level.

Table 4.21 Mean and standard deviation of the strategy for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province - enterprise level

Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province- Enterprise-level strategy	Suitability			Feasibility		
	\bar{X}	S.D.	Level	\bar{X}	S.D.	Level
1. Strengthen school-enterprise cooperation, jointly build on-campus and off-campus training bases, and actively participate in higher vocational colleges' professional construction, curriculum development, and personnel training.	4.72	0.46	highest	4.44	0.51	high
2. Increase resources, equipment, technology, and financial support for industry-education integration and establish special funds for it.	4.64	0.49	highest	3.92	0.70	high
3. Regularly hold industry-education integration lectures, seminars, company open days, and other activities to provide students with sufficient internship and training opportunities.	4.72	0.46	highest	4.44	0.58	high
4. Continue to pay attention to policy trends, technological innovations, and changes in market demand.	4.64	0.49	highest	4.52	0.51	highest

Table 4.21 (Continued)

Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province-Enterprise-level strategy	Suitability			Feasibility		
	\bar{X}	S.D.	Level	\bar{X}	S.D.	Level
5. Provide sufficient human resources to meet the needs of industry- education integration.	4.68	0.48	highest	4.24	0.52	high
Total	4.68	0.47	highest	4.31	0.57	high

According to Table 4.21, it is found that the strategy evaluation experts believe that the overall feasibility of the enterprise-level strategy for sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province is at a high level ($\bar{X}=4.31$), and the suitability is at the highest level ($\bar{X}=4.68$). Except for the measure's feasibility, "continuously paying attention to policy dynamics, technological innovation, and market demand changes," which is considered at the highest level ($\bar{X}=4.52$), the rest are at a high level.

Table 4.22 Mean and standard deviation strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province-student level

Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province-Student-level strategy	Suitability			Feasibility		
	\bar{X}	S.D.	Level	\bar{X}	S.D.	Level
1. Actively participate in internships, practical training, extracurricular practice, innovation and entrepreneurship, and other activities.	4.72	0.46	highest	4.68	0.48	highest
2. Actively communicate and exchange with enterprises and pay attention to market demand and industry trends.	4.56	0.51	highest	4.40	0.58	high
3. Continuously improve professional skills and practical abilities and actively obtain skills or professional qualification certificates.	4.60	0.50	highest	4.56	0.51	highest
4. Continuously strengthen independent learning, humanistic qualities, teamwork, innovation, and entrepreneurship capabilities.	4.48	0.51	high	4.60	0.50	highest
Total	4.59	0.49	highest	4.56	0.52	highest

According to Table 4.22, it is found that the strategy evaluation experts believe that the overall feasibility and suitability of the strategy for sustainable development of the industry-education integration in higher vocational colleges in Guangdong Province - the strategy at the student-school level are at the highest level, respectively ($\bar{x}=4.56$) and ($\bar{x}=4.59$). However, the measure's feasibility of "actively communicating and exchanging with enterprises, paying attention to market demand and industry dynamics" is considered high ($\bar{x}=4.40$), and the rest are at the highest level.

Chapter 5

Conclusion, Discussion, and Recommendations

Strategies for the Sustainable Development of Industry-Education Integration in Higher Vocational Colleges in Guangdong Province. The objectives of this study are as follows: 1) Study the current status of industry-education integration development in higher vocational colleges in Guangdong Province; 2) Formulate strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. Province. 3) Evaluate Strategies for the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province. The research content includes the following four aspects: 1) Government-level strategies. 2) Strategies at the vocational college level. 3) Enterprise-level strategy. 4) Student-level strategies.

The research sample is 384 students and 361 teachers from 5 representative higher vocational colleges in Guangdong Province as the questionnaire survey subjects, and 7 educational managers from 5 higher vocational colleges and 3 senior managers from 3 enterprises are selected as Interviewer. The research tools were literature analysis, questionnaire survey, structured interview, and content analysis. The statistical data of the analysis data are percentage, mean, and standard deviation. The conclusions, discussions, and suggestions of this study are as follows:

Conclusion

Strategies for the Sustainable Development of Industry-Education Integration in Higher Vocational Colleges in Guangdong Province. The researcher summarized the conclusions into 3 parts with details as follows:

Part I: Study the current status of industry-education integration development in higher vocational colleges in Guangdong Province.

Part II: Formulate strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. Province.

Part III: Evaluate Strategies for the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province.

Part I: Study the current status of industry-education integration development in higher vocational colleges in Guangdong Province.

Both students and teachers of higher vocational colleges in Guangdong Province agree that they are at a higher level of the status quo in the four aspects of the development of industry-education integration. Both students and teachers agree that the highest level is the performance of students in the development of industry-education integration, followed by the performance of Higher vocational colleges in the development of industry-education integration, in which the performance of the government in the development of industry-education integration and the performance of enterprises in the development of industry-education integration are at a lower level.

Students and teachers of higher vocational colleges in Guangdong Province both perceive the status quo regarding students' performance in developing industry-education integration at a higher level. However, there are differences in what they consider the highest level. Students of higher vocational institutions in Guangdong Province consider the highest level to be that the industry-education integration can enable higher vocational students to better understand the needs of the enterprises' positions. In comparison, teachers of higher vocational institutions in Guangdong Province consider the highest level to be that the industry-education integration is of great help to higher vocational students' learning and future and that the industry-education integration can significantly increase the competitiveness of the employment of higher vocational students. Secondly, they also differed in several other aspects, such as the belief that the industry-education integration could enable higher vocational students to understand better the actual working environment, the industry-education integration enabled higher vocational students to understand better the specialized knowledge, the industry-education integration could significantly improve the employment competitiveness of higher vocational students,

and the students' willingness to participate in the activities of the industry-education integration. The fact that students in Guangdong's higher vocational colleges considered the lowest level to be the lowest performance of the industry-education integration in significantly helping higher vocational students in their studies and future, but teachers in Guangdong's higher vocational colleges considered it to be the highest level is a good indication that there is a serious bias between students and teachers in Guangdong's higher vocational colleges on this issue of the student's performance in the development of the industry-education integration.

2. The status quo: Both students and teachers of higher vocational institutions in Guangdong Province agree that higher vocational institutions are at a higher level in their performance in developing industry-teaching integration. Both students and teachers agree that the highest level is the positive attitude of higher vocational institutions in promoting industry-education integration, followed by their good results in the training of talents for the industry-education integration in higher vocational institutions (specialization, curriculum construction, internship and practical training, etc.), the strong faculty in higher vocational institutions in the industry-education integration, the good results in the construction of platforms for the industry-education integration in higher vocational institutions (industrial colleges, internship and practical training bases, etc.), and the good results in the industry-education integration in higher vocational institutions. Integration courses or activities are in line with actual work demands, the implementation programs of higher vocational institutions in the industry-education integration policies are perfect, and the effect of the construction of faculty for the industry-education integration in higher vocational institutions (part-time teachers from enterprises, teachers from industry experts, etc.) is good in several other aspects, all of which are the same, and all of which believe that higher vocational institutions have the lowest performance of adequate financial investment in the industry-education integration. The results show that students and teachers of higher vocational colleges in Guangdong Province agree with the performance of higher vocational colleges in the development of industry-education integration.

3. Both students and teachers of higher vocational institutions in Guangdong Province agreed that the performance of enterprises in developing industry-teaching integration is at a high-status quo. Both students and teachers agreed that the highest level was that enterprises played an active role in student internships and employment in the industry-education integration, followed by their agreement in several other aspects, such as that enterprises provided sufficient equipment for the industry-education integration, that enterprises had a positive attitude in promoting the industry-education integration, that enterprises provided sufficient human resources for the industry-education integration, and that enterprises provided sufficient funds for the industry-education integration. Students in the higher vocational institutions in Guangdong Province considered the lowest level to be the deep involvement of enterprises in the integration program. In comparison, teachers in the higher vocational institutions in Guangdong Province considered this the second highest level. The results show that the perceptions of students and teachers in Guangdong's Higher vocational colleges about the performance of enterprises in the development of industry-education integration are generally consistent, but there is also a problematic bias.

4. Both students and teachers of higher vocational colleges in Guangdong Province perceive the government to be at a higher status quo regarding its performance in developing industry-education integration. Both students and teachers agree that the highest level is that the government has provided a sound institutional guarantee for the industry-education integration in higher vocational institutions, the second highest level is that the government has provided sufficient human resources support for the industry-education integration programs in higher vocational institutions, followed by their perceptions in terms of the government's in-depth involvement in the industry-education integration programs in higher vocational institutions, the government's role in facilitating the industry-education integration in higher vocational institutions, the government's role in promoting the industry-education integration in higher vocational institutions, the government's support for the industry-education integration in higher vocational institutions, and

other support. The government provided other support, and the industry-education integration programs in Higher vocational colleges were provided with sufficient financial support. Several other aspects are also basically the same. This result shows that the performance of students and teachers in Higher vocational colleges in Guangdong Province, in terms of the government's performance in developing industry-education integration, is consistent.

Part II: Formulate strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.

The strategies for sustainable development of industry-education integration in Guangdong's higher vocational colleges are categorized into four levels of strategies, including the government, higher vocational colleges, enterprises, and students, and they include 19 measures.

The government-level strategies include: 1) Strengthening the formulation of policies on the industry-education integration, establishing a monitoring, evaluation, and feedback mechanism, and continuously improving them. 2) Increasing financial support and tax incentives and setting up special funds for the industry-education integration. 3) Formulating a master plan and implementation scheme for the industry-education integration and forming a platform for the industry-education integration. 4) Strengthening the publicity and promotion of vocational education and encouraging enterprises and Higher vocational colleges to participate in depth in the activities of the industry-education integration. 5) Strengthen the construction of talent teams for industry-education integration.

Strategies at the level of higher vocational colleges include: 1) Strengthening school-enterprise cooperation, maintaining a smooth communication mechanism, cooperating in building on-campus and off-campus internship and training bases, and jointly declaring research and development projects. 2) Actively soliciting policy and financial support and increasing the financial input for the industry-education integration. 3) Strengthening the construction of the faculty (hiring of enterprise

mentors, teachers practicing in the enterprises, and training of the faculty, etc.). 4) Continuously optimize the curricula system and the mode of training of talents (Specialty setting, curriculum construction, internship training, development of teaching materials, etc.). 5) Setting up a coordinating organization for industry-teaching integration and school-enterprise cooperation.

Strategies at the enterprise level include: 1) Strengthening school-enterprise cooperation, building on-campus and off-campus training bases, and actively participating in the professional construction, curriculum development, and personnel training of Higher vocational colleges. 2) Increasing the resources, equipment, technology, and financial support for the industry-education integration and setting up a special fund for the industry-education integration. 3) Regularly organizing lectures, seminars, and open days for enterprises on industry-education integration and providing students with sufficient internships and training opportunities. 4) Continuously monitoring the policy, technology, and development of the Industry-Education. 4) Continuously pay attention to policy dynamics, technological innovation, and changes in market demand. 5) Provide sufficient human resources to serve the needs of industry-teaching integration.

Strategies at the student level: 1) Actively participate in activities such as internships, practical training, extracurricular practice, and innovation and entrepreneurship. 2) Actively communicate and exchange with enterprises and pay attention to market demand and industry dynamics. 3) Continuously improve professional skills and practical abilities and actively obtain skills or vocational qualification certificates. 4) Continuously strengthen independent learning, humanistic literacy, teamwork innovation, and entrepreneurship abilities.

Part III: Evaluate Strategies for the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province.

Twenty-five expert specialists from higher vocational institutions in Guangdong Province were invited to participate in a workshop on assessing the suitability and

feasibility of strategies for sustainable development of industry-education integration in higher vocational institutions in Guangdong Province. The overall feasibility and suitability of the strategies for improving the sustainable development of the integration of education and industry in Guangdong's Higher vocational colleges were found to be at the highest level, 4.51 and 4.68, respectively. However, the feasibility of the strategies at the enterprise level was found to be at a high level of 4.31, and the rest of the strategies were at the highest level.

The overall feasibility and suitability of the strategies for sustainable development of the industry-education integration in Guangdong's Higher vocational colleges at the governmental level are at the highest level of 4.50 and 4.70, respectively. However, the experts in the strategy evaluation are at a high level of 4.31, and the rest are at the highest level of 4.70, respectively. However, the feasibility of the two measures of “increasing financial support and tax concessions, establishing special funds for the industry-education integration” and “formulating overall planning and implementation programs for the industry-education integration, and establishing a platform for the industry-education integration” are considered to be at a high level of 4.36 and 4.32 respectively, while the rest of the measures are all at the highest level.

Strategy evaluated experts believe that the overall feasibility and suitability of improving the sustainable development of the industry-education integration in higher vocational colleges in Guangdong Province at the level of higher vocational colleges are at the highest level, with 4.68 and 4.75, respectively. However, the measure's feasibility of “Actively striving for policy and financial support, and increasing the financial input for the industry-education integration” is high, with the rest being at the highest level. However, the feasibility of the measure “actively seeking policy and financial support, and increasing capital investment in the industry-education integration” is considered to be at a high level of 4.44. The rest are at the highest level.

The overall feasibility of the strategy to improve the sustainable development of the industry-education integration in Guangdong's Higher vocational colleges at the enterprise level is considered by the strategy evaluation experts to be

at a high level of 4.31, while the suitability is at the highest level of 4.68. Except for the measure of “continuously paying attention to policy developments, technological innovations, and changes in the market demand,” the feasibility of this measure is considered to be at the highest level. Except for the feasibility of this measure, which is considered at the highest level of 4.52, all the others are at a high level.

The overall feasibility and suitability of the strategy to improve the sustainable development of the industry-education integration in Guangdong's Higher vocational colleges at the student-school level are considered by the strategy evaluation experts to be at the highest level of 4.56 and 4.59, respectively. However, the measure's feasibility of “actively communicating with the enterprises and paying attention to the market demand and the industry dynamics” is considered to be at the highest level of 4.59. However, the feasibility of the measure “active communication and exchange with enterprises, pay attention to market demand and industry dynamics” is considered to be at a high level of 4.40, and the rest of the measures are at the highest level.

Discussion

Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province. The researcher summarized the discussion into 3 parts with details as follows:

Part I: Study the current status of industry-education integration development in higher vocational colleges in Guangdong Province.

Part II: Formulate strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. Province.

Part III: Evaluate Strategies for the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province.

Part I: Study the current status of industry-education integration development in higher vocational colleges in Guangdong Province.

The status quo of the industry-education integration in Guangdong Province's higher vocational institutions is high. Considering the results of this study, from the highest to the lowest level is as follows: the highest level is the performance of students in the development of industry-education integration, followed by the performance of Higher vocational colleges in the development of industry-education integration, and lastly, the performance of the government in the development of industry-education integration and the performance of enterprises in the development of industry-education integration.

Students' performance in the industry-education integration development is at a high level. This result is consistent with Chai Meijuan's (2020) suggestion that students are the core protagonists of the industry-education integration and that students' in-depth practice in enterprises and the combination of theoretical knowledge and practical work not only exercise their practical ability but also provide new kinetic energy for the development of the industry. At the same time, Wang Zhongxiao (2019) also believes that the practical experience of students' feedback constantly promotes the optimization of teaching and forms a two-way interaction between Industry-Education, so vocational colleges need to pay more attention to the cultivation of students' innovative ability and practical skills so that students can better adapt to the new trends and new needs of industrial development and become socialist builders and successors. Liu Lian and Zhao Kai (2020) also mentioned the student-centered industry-teaching integration model in the typical model of industry-teaching integration, which not only improves the comprehensive quality and employment competitiveness of students but also conveys more high-quality talents that meet the market demand for enterprises, and jointly pushes forward the innovative development of Industry-Education.

The performance of Higher vocational colleges in developing industry-education integration is at a high level. Sun Weiping and Wang Ronghui (2008) said in their analysis of the organizational system of industry-education integration that

Higher vocational colleges are the pivotal link of industry-education integration, which serves as a bridge for the integration of education and industry, and that Higher vocational colleges, as an important part of vocational education, are closely linked to the development of industry in terms of their educational objectives. This close partnership not only enhances students' practical ability and professionalism but also provides a steady stream of high-quality skilled talents for enterprises. Based on the perspective of public governance, Li Jin (2016) pointed out that Higher vocational colleges have the advantages of scientific research and technical services, which can provide technical support and innovation services for enterprises.

The government's performance in developing industry-education integration is at a high level. In his discussion of government functions, Dong Gang (2019) points out that the government is the leading supporter and promoter of the development of industry-education integration. By formulating and implementing preferential policies, such as resource supplementation, financial and tax exemptions, and land guarantees, the government encourages enterprises to invest in industry-education integration programs. It supports in-depth cooperation between schools and enterprises. Polonium Yang (2022) suggests in his thesis that the government can help to promote the industry-education integration to the depth and promote the deep integration and synergistic development of education and industry.

Enterprises are at a high level of performance in developing industry-education integration. According to Hui-Qin Liao (2017), industry-education integration is the cooperation between schools and enterprises, and enterprises are the participants and promoters of the industry-education integration programs. Yang Songsong (2021), in discussing the connotation of the school-enterprise cooperation model, pointed out that enterprises can work together with schools to formulate the development plan, implementation program, and evaluation standards of the industry-education integration programs, etc., to ensure that the industry-education integration programs are implemented smoothly and achieve practical results. At the same time, enterprises can also provide funding, equipment, venues, and other

support for the industry-education integration projects to promote the landing and sustainable development of the projects.

Part II: Formulate strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.

According to Table 4.17, the researchers provided strategies for sustainable development of the industry-education integration in Guangdong's Higher vocational colleges, covering four aspects and 19 measures.

These strategies and measures are essential for improving the sustainable development of industry-education integration in higher vocational institutions in Guangdong Province. The following discussion, based on relevant references, will support this conclusion.

1. First, government-level strategies are the fundamental guarantee for improving the sustainable development of the industry-education integration in Guangdong's higher vocational institutions. The study shows that the government level provides policy orientation for industry-education integration, increases financial investment, formulates the master plan, social publicity, and promotion, and strengthens the construction of human resources, all specific implementation paths and safeguards for industry-education integration. Together, These measures promote the in-depth development of industry-education integration and provide strong talent and intellectual support for economic and social development.

2. Secondly, the strategy at the level of higher vocational institutions is a key factor in improving the sustainable development of the industry-education integration in higher vocational institutions in Guangdong Province. The study shows that measures at the level of Higher vocational colleges to strengthen school-enterprise cooperation, increase financial investment, strengthen the construction of faculty, optimize the curriculum system, and set up specialized institutions are all key factors directly affecting the sustainable development of the industry-education integration. These initiatives improve the quality of education and the level of

operation of higher vocational institutions and provide students with more learning and employment opportunities related to actual work.

3. Third, enterprise-level strategies are an indispensable and important force in improving the sustainable development of industry-teaching integration in higher vocational institutions in Guangdong Province. The study shows that enterprise-level measures such as strengthening school-enterprise cooperation with Higher vocational colleges, setting up special funds, providing practical training opportunities, paying attention to market dynamics, and providing sufficient human resources have ensured a close match between educational content and industrial demand, and improved the relevance and effectiveness of education. Enterprises have played an active role in the industry-education integration, making important contributions to cultivating more high-quality skilled personnel and promoting industrial upgrading and transformation.

4. Finally, student-level strategies directly affect the sustainable development of industry-teaching integration in Guangdong's higher vocational institutions. The study shows that student-level measures such as actively participating in internships, strengthening exchanges with enterprises, upgrading professional skills, and enhancing independent learning deepen students' understanding of specialized knowledge and improve their practical skills and problem-solving abilities. By participating in the actual projects and work of enterprises, students can exercise their teamwork, communication, organizational coordination, etc., and can enhance their professional ability and competitiveness effectively.

In summary, based on the support of relevant references, the strategies and measures proposed in Table 4.17 are essential to improve the sustainable development of industry-teaching integration in higher vocational institutions in Guangdong Province. The sustainable development of the industry-education integration in Guangdong's higher vocational colleges can be effectively improved by strengthening the strategies at four levels: government, higher vocational colleges, enterprises, and students, which are interrelated and mutually reinforcing, and together they promote the overall development in the industry-education

integration. However, it should be noted that different regions may face unique challenges and contexts, so implementing these strategies should be adjusted and optimized accordingly.

Part III: Evaluate Strategies for the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province.

In summary, the suitability and feasibility of strategies for sustainable development of industry-education integration in Guangdong's Higher vocational colleges achieved favorable results, with scores between 4.00 and 5.00. The study shows that the strategies of Guangdong higher vocational institutions to improve the sustainable development of industry-education integration show a high degree of flexibility in their management practices, enabling them to adapt quickly to changing internal and external environments. Various strategies were formulated and implemented, considering the uniqueness of the region's industry-education integration environment and the inherent strengths and weaknesses of higher vocational institutions.

This study identified several critical success factors that contribute to strategies for improving the sustainability of industry-education integration. First, the core of industry-education integration is the in-depth interaction between enterprises and Higher vocational colleges, which helps to achieve the optimal allocation of educational and industrial resources and promotes the organic convergence of the education and talent chains with the industrial and innovation chains. Secondly, vocational colleges should establish long-term and stable cooperative relationships with enterprises, jointly formulate talent training programs, and develop curriculum resources and practical training projects. A virtuous cycle of resource sharing and complementary advantages can be formed through close school-enterprise cooperation. Finally, strengthening the construction of faculty and improving teachers' practical teaching ability and scientific research level is the key to improving the quality of industry-teaching integration. Actively introduce enterprise experts with

rich practical experience to teach students and provide students with guidance and teaching closer to industrial reality.

However, while the results are very encouraging, specific challenges deserve attention. In terms of industry-education integration, although Higher vocational colleges are actively promoting it and the government is vigorously promoting and supporting it, some enterprise enterprises do not have enough knowledge about industry-education integration and do not participate actively. Some enterprises do not have enough depth of cooperation in the industry-education integration and stay at the surface level only. Therefore, by deepening university-enterprise cooperation, strengthening communication and coordination, formulating long-term planning, and enhancing information sharing, we can promote the sustainable development of industry-education integration and bring greater benefits to enterprises and Higher vocational colleges.

In summary, the results of this study emphasize the extraordinary suitability and feasibility of strategies for sustainable development of industry-education integration in higher vocational institutions in Guangdong Province. However, over time, vigilance is needed to monitor market changes and internal institutional developments to ensure the strategies adopted align with the latest needs and challenges.

Recommendations

Implications

The results of the study show that the following strategies are recommended to improve the sustainable development of industry-education integration in Higher vocational colleges in Guangdong Province:

1. For the government, it can promote economic development. Industry-education integration can encourage scientific and technological innovation and economic development, improve enterprises' innovation abilities and core competitiveness, and promote regional economic upgrading and development. So, the government should focus on improving policies, regulations, and incentives to

enhance the sustainable development of industry-teaching integration. Guangdong Province should expeditiously promulgate the “Guangdong Province Vocational Education Industry-Education Integration Promotion Regulations” to safeguard and promote vocational education industry-industry integration from the legal level. Refine and implement preferential policies on taxation and finance for enterprises integrating production and education, form a perfect mechanism to support internships for students of vocational colleges, and provide incentives to urge the efficient implementation of the policies. Setting up special funds for the industry-education integration, compensating the labor and material costs required by industrial enterprises to participate in the industry-education integration, and actively guiding enterprises to accept internships for students of vocational colleges to solve the problem of the lack of motivation for enterprises to participate in the industry-education integration.

2. For the higher vocational colleges, it can improve the quality of education and teaching. Industry-education integration can blend education and industry, making the teaching content closer to actual needs, which can better cultivate high-quality talents that meet market demands. The higher vocational colleges should focus on the sustainable development of industry-teaching integration by improving the matching degree between majors and industries and enhancing the practical ability of teachers. So, the higher vocational colleges should improve and perfect the system of specialty setting and dynamic adjustment mechanism with industrial development, take the initiative to set up specialties (groups) against the national and regional leading industries, pillar industries, and strategic emerging industries, and improve the matching degree between the academic specialty system of the school and the regional industrial system. Vocational colleges and enterprises have jointly formulated professional talent training programs, cooperated in the development of curricula, teaching materials, and teaching resource libraries, promoted the integration of “class, job, competition, and certificate,” aligned the content of curricula with occupational standards, aligned the teaching process with the production process, and incorporated new technologies, new techniques, and new

specifications into the teaching standards and content promptly. Improve the number and quality of cooperative enterprises accepting teachers from vocational colleges to carry out enterprise practice for more than three months each year, and improve teachers' practical teaching ability and innovation ability in applied technology.

3. For the enterprises, it can enhance industrial competitiveness for enterprises. Industry-education integration can improve the core competitiveness of upstream and downstream enterprises in the industrial chain, introduce high-quality talent, and provide customized technical services. At the enterprise level, the focus should be on enhancing the sustainable development of industry-teaching integration by strengthening school-enterprise collaborative education and building a collaborative innovation platform. So, the enterprises should work with Higher vocational colleges to formulate professional talent training programs, cooperate in the development of curricula, teaching materials, and teaching resource libraries, and jointly organize students' vocational skills competitions and innovation and entrepreneurship competitions with Higher vocational colleges, and cooperate in guiding students to carry out internship training, graduation design, and technological research. Enterprises should attach great importance to and cooperate with Higher vocational colleges to jointly build engineering and technology centers, engineering and technology research institutes, innovation and research centers, and think tank platforms. To cooperate with Higher vocational colleges to carry out the quantity and quality of vertical and horizontal scientific research projects, focusing on the effectiveness of the transformation of research results, to serve the new round of scientific and technological revolution and industrial change, and to support the enterprise technology research and development and product upgrading.

4. For the students, it can improve their employment rate. Through industry-education integration, students can quickly adapt to the enterprise's working environment and increase employment opportunities. At the same time, enterprises can better recruit suitable talent. So, the student level should be important to improve the sustainable development of industry-education integration by actively

participating in practice and improving comprehensive quality. Through close cooperation with enterprises, students can enter the real working environment and get in touch with the actual workflow and technology application. Such practice deepens their understanding of professional knowledge and improves their practical operation and problem-solving ability. Students can practice teamwork, communication, and organizational skills by participating in real projects and the work of enterprises. Improving these comprehensive qualities will make students more competitive in future career development and better adapt to the ever-changing market demand.

Future Researches

The following are some potential areas for future research in the field of improving the sustainable development of industry-education integration in Guangdong's higher vocational institutions:

1. At the government level, the government plays the role of guide and coordinator in integrating Industry-Education. Future research should focus on "policy coordination and institutional innovation." Policy coordination mechanism: How to form a policy synergy through cross-departmental collaboration (such as education, human resources, social security, science and technology, industry, etc.) to promote the implementation of industry-education integration. Institutional innovation: How to establish a modern vocational education system that adapts to the needs of industry-education integration, including credit recognition, dual-qualified teacher certification, and corporate participation incentive mechanism. Financial support and performance evaluation: How to optimize the financial investment mechanism, establish a scientific performance evaluation system, and ensure the effectiveness and sustainability of the industry-education integration policy.

2. At the level of higher vocational colleges, higher vocational colleges are the primary implementers of industry-education integration. Future research should focus on the "governance model and curriculum reform." Governance model of higher vocational colleges: How to build a governance structure with deep

integration of schools and enterprises, such as industrial colleges and mixed-ownership schools. Curriculum system reform: How to dynamically adjust the curriculum according to industry needs and develop a modular and project-based curriculum system. Construction of a team of dual-qualified teachers: How to cultivate dual-qualified teachers with theoretical knowledge and practical skills through school-enterprise cooperation. Digital and intelligent transformation: Using information technology (such as artificial intelligence and big data) to improve teaching quality and school-enterprise collaboration efficiency.

3. At the enterprise level, enterprises are important participants and beneficiaries of industry-education integration, and future research should focus on "participation motivation and benefit sharing." Enterprise participation motivation mechanism: How to improve the enthusiasm of enterprises to participate in industry-education integration through policy incentives, tax incentives, and other measures. Benefit sharing mechanism: How to build a school-enterprise benefit sharing mechanism, such as intellectual property distribution and profit sharing of achievement transformation. Corporate social responsibility and talent training: How to incorporate industry-education integration into the corporate social responsibility framework and promote enterprises to participate in talent training deeply. SME participation path: How to solve the problems of insufficient resources and high participation threshold faced by SMEs in industry-education integration.

4. At the student level, students are the ultimate beneficiaries of industry-education integration, and future research should focus on "career development and capacity improvement." Career development ability: How to improve students' professional literacy, practical ability innovation, and entrepreneurship ability through industry-education integration. Personalized learning path: How to design personalized learning paths based on students' interests and career plans. Employment quality and satisfaction: How to improve students' employment quality and satisfaction with vocational education through industry-education integration. Lifelong learning ability: How to cultivate students' lifelong learning ability in

integrating Industry-Education to adapt to the rapidly changing professional environment.

Industry-education integration is a complex system project that requires the coordinated efforts of the government, higher vocational colleges, enterprises, and students. Future research should focus on multi-level and multi-dimensional integrated analysis to explore more effective models of industry-education integration. At the same time, international comparative studies should be strengthened, and the successful experience of developed countries in industry-education integration should be learned to promote the innovative development of vocational education. By deepening the Industry-Education integration, not only can the quality of vocational education be improved, but strong talent support can also be provided for the high-quality development of the economy and society.

References

- A resource-based view of the firm-Wernerfelt-1984-*Strategic Management Journal* - Wiley Online Library. (1984).
- Amano, I. (2018). Japan's vocational education system and its development. *Journal of Asian Studies*, 45(3), 567–589. <https://doi.org/10.2307/jas.45.3.567>
- Bai, Yixian, Wang, Hua, & Jun Wang. 2011 A new species of the genus *Pseudourostyla* (Hymenoptera, Braconidae, Braconinae). (2022). Status quo, problems and countermeasures of China's national education integration reform--an analysis based on 103 typical cases. *China Higher Education Research*, 9, 88-94. <https://doi.org/10.16298/j.cnki.1004-3667.2022.09.15>
- Barnett, R. (2023). Super-complexity and the challenges of lifelong learning. *Journal of Education Policy*, 38(2), 147-162. <https://doi.org/10.1080/02680939.2023.2154883>
- BIBB. (2021). *Vocational education and training in Germany*. Federal Institute for Vocational Education and Training. Retrieved from <https://www.bibb.de>
- Busemeyer, M. R., & Trampusch, C. (2012). The political economy of collective skill formation. *Oxford University Press*.
- C. K. Prahalad, Gary Hamel. (1994). Strategy as a field of study: Why search for a new paradigm? - Prahalad-1994-*Strategic Management Journal*- Wiley Online Library.
- Cai, W. B., & Tian, Lu. (2022). High-quality development of higher vocational education: path stickiness, hysteresis effect and guidance strategy. *Vocational and Technical Education*, 43(4), 11-17.
- Cao, Huiting. (2018). *Research on School-Enterprise Cooperation in Higher Vocational Education Based on German "Dual System"* [Master]. Qinghai Normal University.
- Chagid. (2011). Reflections on the objective of cultivating talents in higher vocational education. *Journal of Hebei Normal University (Education Science Edition)*, 13(3), 68-71. <https://doi.org/10.13763/j.cnki.jhebnu.es.2011.03.016>

- Chai, Meijuan. (2020). Exploration and practice of "five-double-integration" talent cultivation mode in higher vocational colleges and universities for industry-teaching integration. *Mechanical Vocational Education*, 9, 28-31.
<https://doi.org/10.16309/j.cnki.issn.1007-1776.2020.09.007>
- Chang, Xiaoyu. (2019). Teaching Reform of Innovation and Entrepreneurship Education in Higher Vocational Colleges and Universities Based on the industry-education integration. *Education and Career*, 21, 76-80.
<https://doi.org/10.13615/j.cnki.1004-3985.2019.21.013>
- Chen, Feng. (2018). industry-education integration: The path of deepening and evolution. *China Higher Education*, Z2, 13-16.
- Chen, Juan, & Ma, Guosheng. (2010). Research on opportunities and countermeasures of higher vocational education in agriculture and forestry in the construction of ecological civilization. *Anhui Agricultural Bulletin (First Half)*, 16(23), 198-201.
<https://doi.org/10.16377/j.cnki.issn1007-7731.2010.23.064>
- Chen, J. (2021). Research on the implementation effect of industry-education integration policy in higher vocational colleges. *Vocational Education Research*, 39(4), 123-135.
- Chen, M.S. (2003). Establishing the concept of sustainable development of vocational education. *Vocational and Technical Education*, 24(16), 72.
- Chen, Nian-You, Zhou, Chang-Qing, & Wu, Zhuping. (2014). The Connotation and Realization Path of Industry-Education Integration. *China University Science and Technology*, 8, 40-42. <https://doi.org/10.16209/j.cnki.cust.2014.08.027>
- Chen, X. (2023). The role of industry-education integration in enhancing vocational education quality: A case study from China. *Journal of Vocational Education and Training*, 75(1), 25-42. <https://doi.org/10.1080/13636820.2023.2151234>
- Chen, Yi-wen. (2019). *Research on the Development Strategy of Industry-Education Integration in Guizhou Higher Vocational Colleges and Universities* [M.S.]. Wuhan Engineering University.

- Cheng, Yan. (2013). Research on the characteristics and management of students in higher vocational colleges and universities. *Journal of Changsha Railway College (Social Science Edition)*, 14(2), 256-257.
- Circular of the Ministry of Education on the Issuance of the Opinions of the Ministry of Education on Strengthening Talent Cultivation Work in Higher Vocational College Education. (2000). *Ministry of Education Newspaper*, 5, 208-220.
- Circular of the Ministry of Education on the Issuance of the Twelfth Five-Year Plan for the Development of the National Education Program The Twelfth Five-Year Plan for the Development of the National Education Program (June 2012)_ *Gazette of the State Council No. 28 of 2012_ Chinese Government Web*. (2012).
- Dong, G. (2019). Reflections on the high-quality development of higher vocational education in the new era. *China Vocational and Technical Education*, 7, 49-51.
- Du, A. (2010). *Study on the Finance of Higher Vocational Education in China [PhD]*. Institute of Fiscal Science, Ministry of Finance.
- Fang, Y., Yun-Bi, H. & Li-Ying, K. (2020). New Exploration of Industry-Education Integration in China's Higher Vocational Colleges and Universities Based on Community of Destiny. *Vocational Education Forum*, 1, 128-132.
- Flora. (2022). *Research on the optimization of the operation mechanism of the integration of production and education in higher vocational colleges and universities in Gansu Province* [Master's degree, Lanzhou University].
<https://doi.org/10.27204/d.cnki.glzhu.2020.003400>
- Fong, M. (2004). Scientific research is the driving force for sustainable development of higher vocational education. *Journal of Jinhua Institute of Vocational Technology*, 2, 93-95.
- Fuller, A., & Unwin, L. (2018). Apprenticeship in the UK: From tradition to innovation. *Journal of Vocational Education & Training*, 70(1), 1-18.
- Gonon, P. (2019). The Swiss vocational education and training system: A model for sustainable development. *European Journal of Education*, 54(2), 145-160.

- Guangdong Provincial Department of Education. (2019). *Implementation plan for the reform and development of vocational education in Guangdong Province*. Retrieved from <http://edu.gd.gov.cn>
- Guangdong Provincial Department of Education. (2020). *Implementation plan for the industry-education integration in Guangdong Province*. Retrieved from <http://edu.gd.gov.cn>
- Guangdong Provincial Department of Education. (2021). *Implementation plan for the industry-education integration in Guangdong Province*. Retrieved from <http://edu.gd.gov.cn>
- Guangdong Provincial Human Resources and Social Security Department. (2020). *Guangdong Province skill enhancement action plan*. Retrieved from <http://hrss.gd.gov.cn>
- Hao, Chun. (2022). *Research on the Problems and Countermeasures in the Implementation of the Policy of Industry-Education Integration in Vocational Education in Sichuan Province* [Master's Degree, Sichuan University]. <https://doi.org/10.27342/d.cnki.gscdu.2021.000842>
- He, H. (2023). Policy frameworks for promoting sustainable development in vocational education: Insights from global practices. *International Journal of Educational Development*, 90, 102511. <https://doi.org/10.1016/j.ijedudev.2023.102511>
- He, Y. (2021). Research on the effect deviation of industry-education integration policy in higher vocational colleges in Nanchang. *Education Policy Research*, 28(3), 45-58.
- He Yan. (2021). *Research on the Policy Effect of Industry-Teaching Integration in Higher Vocational Education* [Master, Nanchang University]. <https://doi.org/10.27232/d.cnki.gnchu.2020.003568>
- He, Yinglin. (2014). A study on the cultivation of curriculum development ability of higher vocational "dual-teacher" teachers. *Experimental Technology and Management*, 31(1), 142-146. <https://doi.org/10.16791/j.cnki.sjg.2014.01.040>

- Jiang, X. G. (2020). Research on the construction of governance system of industrial colleges under the perspective of industry-education integration. *Vocational and Technical Education*, 41(24), 30-34.
- Jin, R., Li, Y., & Zhang, Y. (2012). The foundations of sustainable learning. *Sustainable Education Research*, 5(4), 389-402.
- LAM CHUN. (2022). Orientation, Tasks and Paths of Deepening Reform of China's Higher Vocational Education in the "14th Five-Year Plan" Period. *Education and Career*, 4, 5-12. <https://doi.org/10.13615/j.cnki.1004-3985.2022.04.001>
- Law of the People's Republic of China on Higher Education - Government Portal of the Ministry of Education of the People's Republic of China. (2015).
- Leung, L.H. (2002). Four key aspects of sustainable development of higher vocational education. *Journal of Wuxi College of Commerce and Vocational Technology*, 4, 31-33.
- Li J. (2016). Exploration of the interest demands and governance logic of member units of vocational education groups. *Vocational and Technical Education*, 37(16), 24-28.
- Li, J. (2010). Sustainable Development of Higher Vocational Education and Sustainable Development of Frontline Talents. *China Higher Education Research*, 12, 8-11. <https://doi.org/10.16298/j.cnki.1004-3667.2010.12.018>
- Li, Man. (2006). Research on the support system of information resource management talents in colleges and universities. *Journal of Jiaozuo University*, 1, 111-112. <https://doi.org/10.16214/j.cnki.cn41-1276/g4.2006.01.042>
- Li, M. (2020). Industry-education integration policy design and institutional innovation. *China Higher Education Research*, 35(2), 67-78.
- Li, Mengqing, & Chen, Peiyun. (2020). Research on the construction of teaching innovation team of "dual-teacher" teachers under the background of "double-high program". *Education and Career*, 8, 79-84. <https://doi.org/10.13615/j.cnki.1004-3985.2020.08.013>

- Li, Mengqing, & Li, Xin. (2020). Practical barriers and cracking paths to deepen the industry-education integration in higher vocational colleges under the "Double-High Program". *Vocational Education Forum*, 36(6), 44-50.
- Li, W. (2021). The role of vocational education in promoting social equity. *Education and Society*, 1(3), 25-30.
- Li, Yuhong, Qi, Zaiqian, Huang, Xiankai, Sun, Xiaokun, Luo, Yingxia, & Zhi, Fenhe. (2016). Research on the construction of teaching standards for the articulation of vocational education in middle, high school and university. *China Vocational and Technical Education*, 11, 61-69.
- Liao, Huiqin. (2017). *Research on the Operation Mechanism of Industry-Teaching Integration in Higher Vocational Education in Guangdong Province* [Master]. Guangdong Technical Normal College.
- Lin, Qiang. (2007). A review of the orientation of talent cultivation objectives in higher vocational colleges and universities. *China Adult Education*, 11, 76-77.
- Liu, F. (2022). Problems and countermeasures in the design of industry-education integration policy. *Education Development Research*, 42(6), 34-47.
- Liu, L., & Zhao, K. (2020). Analysis of Talent Cultivation Mode of Typical Higher Vocational Colleges and Universities through "industry-education integration, School-Enterprise Cooperation". *Modern Business Industry*, 41(36), 66-67.
<https://doi.org/10.19311/j.cnki.1672-3198.2020.36.031>
- Liu, Xiangda. (2023). industry-education integration: The road to sustainable development of vocational education. *Science Consulting (Science and Technology - Management)*, 6, 158-160.
- Lu, X. (2020). The practice and exploration of industry-education integration and vocational education reform. *Modern Vocational Education*, 8, 45-48.
- Lu, X., & Wei, A. (2015). Autonomous learning in vocational education. *Journal of Vocational Education Research*, 36(2), 41-47.
- Luo, M.K., & Li, Y. (2004). Comparative study of vocational education in China and Australia. *Journal of Guiyang Jinzhu University*, 1, 64-73.
<https://doi.org/10.16856/j.cnki.52-1142/n.2004.01.018>

- Mao, N., Zhang, W., & Li, Z. (2020). Lifelong learning in the information age. *Journal of Adult and Continuing Education, 26*(2), 205-220.
- MEXT. (2021). Vocational education reform in Japan. Ministry of Education, Culture, Sports, Science and Technology. Retrieved from <https://www.mext.go.jp>
- Ministry of Education of the People's Republic of China. (2020). Summary of the pilot work on modern apprenticeship. Retrieved from <http://www.moe.gov.cn>
- Miller, R. (2020). Industry-education collaboration in the United States: A case study of community colleges. *Journal of Higher Education, 91*(5), 678-695.
- Mu, J. (2006). *Economic analysis of sustainable development of higher education* [PhD]. Tianjin University.
- Müller, W., & Gangl, M. (2019). Transitions from education to work in Europe: The integration of youth into EU labour markets. Oxford University Press.
- OECD. (2018). Education 2030: The future of vocational education. OECD Publishing.
- Opinions of the Ministry of Education on Promoting the Reform and Innovation of Higher Vocational Education and Leading the Scientific Development of Vocational Education - Government Portal of the Ministry of Education of the People's Republic of China. (2011).
- Pallbearer Red. (2023). Research on the Construction of Industry-Education Integration City Based on Triple Helix Theory [M.S., Xihua Normal University]. <https://doi.org/10.27859/d.cnki.gxhsf.2022.000104>
- Perkins Act. (2018). Strengthening Career and Technical Education for the 21st Century Act. Retrieved from <https://www.congress.gov/bill/115th-congress/house-bill/2353>
- Polonium Yang. (2022). Skill formation and regional innovation: a functional analysis of school-enterprise cooperation in vocational education. *China Education Fiscal Policy Consultation Report (2019-2021)*, 5. <https://doi.org/10.26914/c.cnkihy.2022.000985>
- Qin, Y., Yu, S., & Li, J. (2018). Adapting to a changing world: The role of sustainable learning. *International Journal of Educational Research, 90*, 15-25. <https://doi.org/10.1016/j.ijer.2018.06.005>

- Qiu, Hui, & Fan, Qian. (2016). Power mechanism and strategy for promoting the deep industry-education integration. *Heilongjiang Higher Education Research*, 12, 102-105.
- Shen Meng. (2020). *Research on Realization Mechanism of Industry-Teaching Integration and School-Enterprise Cooperation in Yunnan Vocational Education* [Master]. Yunnan University.
- Smith, P., & Johnson, L. (2018). The dual system of vocational education in Germany: A model for sustainable development. *European Journal of Education*, 53(2), 189-204.
- Sun, Wei-Ping, & Wang, Rong-Hui. (2008). Research on the Mechanism of Combining Industry, Academia and Research in Vocational Education. *Journal of Chongqing Vocational and Technical College*, 4, 1-3.
- Tang, X. X. (2011). *The schooling experience of American community colleges and its inspiration to the development of higher vocational education in China* [Master]. Zhongnan University for Nationalities.
- Tan, J. (2020). Skills Future Singapore: A case study of lifelong learning policy. *International Journal of Lifelong Education*, 39(4), 345-360.
- Vocational Education Law of the People's Republic of China - Government Portal of the Ministry of Education of the People's Republic of China. (2022).
- Virolainen, M. (2019). Finnish vocational education and training: A focus on student agency. *Journal of Vocational Education & Training*, 71(3), 456-472.
- Wang Lei. (2022). *Research on the Construction of Industry-Teaching Integration and Collaborative Education Community in Higher Vocational Education* [Master, Nanchang University]. <https://doi.org/10.27232/d.cnki.gnchu.2021.002650>
- Wang, Blue. (2015). On the industry-education integration under the perspective of modern apprenticeship system. *Journal of Guangdong Technical Teachers College*, 36(10), 49-52+56. <https://doi.org/10.13408/j.cnki.gjstxb.2015.10.014>
- Wang, Danzhong, & Zhao, Peihua. (2014). Exploration of collaborative education mechanism in higher vocational colleges under the perspective of industry-teaching integration. *China Higher Education*, 21, 47-49.

- Wang, H. (2021). Institutional innovation and industry-education integration. *Higher Education Research*, 40(3), 78-90.
- Wang, Lingling. (2015). The construction of industry-teaching integration model of modern vocational education and the way of implementation. *Hubei Social Science*, 8, 160-164. <https://doi.org/10.13660/j.cnki.42-1112/c.013309>
- Wang, Qiuyu. (2017). Research on the operation mechanism of local undergraduate colleges to deepen the industry-education integration. *China Adult Education*, 13, 36-39.
- Wang, Wanchuan, Liu, Xiaoming, Huang, Xinghai, & Qian, Jun. (2016). Research on the Connotation and Practical Path of the Development of Industry-Education Integration--Taking Yangzhou Software and Information Industry as an Example. *Career Times*, 12(5), 5-7.
- Wang, Y. (2007). A few thoughts on talent cultivation objectives of higher vocational colleges and universities. *Journal of Yantai Vocational College*, 1, 7-9.
- Wang, Z. D. (2019). A preliminary study of students' characteristics and management countermeasures in higher vocational colleges and universities. *Henan Education (Vocational and Adult Education)*, 11, 8-9. <https://doi.org/10.16586/j.cnki.41-1033/g4.2019.11.003>
- Wang, Z., & Zhang, Q. (2023). UNESCO's vision for education: Rethinking the future of learning. *Global Education Review*, 10(1), 4-20.
- Wang, Zhongxiao. (2019). Thinking and Practice of Higher Vocational Accounting Specialization Construction in the Context of Industry-Teaching Integration--Taking the Accounting Specialization of Zhejiang Financial Vocational College as an Example. *Modern Vocational Education*, 31, 226-227.
- Wehrich, H. (1982). The TOWS matrix-A tool for situational analysis. *Long Range Planning*, 15(2), 54-66. [https://doi.org/10.1016/0024-6301\(82\)90120-0](https://doi.org/10.1016/0024-6301(82)90120-0)
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171-180. <https://doi.org/10.1002/smj.4250050207>
- Wheelahan, L., Buchanan, J., & Yu, S. (2015). Linking qualifications and the labour market through capabilities and vocational streams. NCVET.

- World Bank. (2021). *Skills development in South Asia: Trends and challenges*. World Bank Group.
- Wu, Yuqian. (2016). *Research on Countermeasures for Sustainable Development of Higher Vocational Education* [Master]. Suzhou University.
- Xianghua, X. (2010). Human resources and sustainable development. *Human Resource Management Journal*, 20(4), 373-390.
- Xiao, Ronghui, & Tian, Jin. (2020). Research on the Coupling Mechanism between Higher Vocational Education and Regional Economy Based on the Collaboration between Government, School and Enterprise. *Educational Exploration*, 2, 31-36.
- Xie and Wei. (2022). Thinking clearly about vocational education--Talking about the localization of vocational education. *China Vocational and Technical Education*, 6, 5-10.
- Xie, Yingjing. (2020). Research on ideological and behavioral characteristics of students in higher vocational colleges and educational countermeasures. *Journal of Huainan Vocational and Technical College*, 20(3), 56-57+93.
- Xiong, Huiping. (2008). Perspectives on the Evolution of Social Responsibility Ideas of Higher Vocational Education Construction Companies Based on Green Technology. *Journal of Kunming University of Technology (Social Science Edition)*, 2, 67-70.
- Xu, J., Jialu, L., & Li, X. (2023). Adapting to change: *Education for the 21st century*. *Education and Training*, 65(3), 263-276.
- Yan Xi. (2023). Deepening School-Enterprise Cooperation and Promoting Talent Cultivation. *Talent Resources Development*, 16, 24-26.
<https://doi.org/10.19424/j.cnki.41-1372/d.2023.16.031>
- Yang, H. F. (2024). Discussion on the path and strategy of promoting the industry-education integration and school-enterprise cooperation in higher vocational education. *Science and Technology Wind*, 4, 82-84.
<https://doi.org/10.19392/j.cnki.1671-7341.202404028>

- Yao H. (2008). *Research on sustainable development of higher vocational education* [Master]. Hunan Normal University.
- Yeh, H.K. (2010). Characterization and Future Development of Higher Vocational Education: A Comparative Perspective with General Higher Education. *Research on Education Development*, 30(1), 42-46. <https://doi.org/10.14121/j.cnki.1008-3855.2010.01.019>
- Yoshimoto, K. (2021). Lifelong learning in Japan: Policies and practices. *Journal of Adult and Continuing Education*, 27(1), 23-38.
- Zhang Ye. (2018). Learning characteristics and countermeasures of students in higher vocational colleges and universities. *Education Modernization*, 5(42), 310-311. <https://doi.org/10.16541/j.cnki.2095-8420.2018.42.145>
- Zhang, F., & Yuan, G.X. (2008). Research on sustainable development of higher vocational education. *Journal of Beijing City College*, 5, 28-31+40. <https://doi.org/10.16132/j.cnki.cn11-5388/z.2008.05.018>
- Zhang, Jian. (2020). Deepening the "trinity" innovation of the pilot construction of industry-teaching integration. *Henan Education (Vocational Education)*, 3, 12-13. <https://doi.org/10.16586/j.cnki.41-1033/g4.2020.03.004>
- Zhang, Miaodi, & Jiang, Xiaoming. (2004). Doing a good job in graduate employment and realizing the sustainable development of higher vocational education. *China Higher Education Research*, 1, 41-43. <https://doi.org/10.16298/j.cnki.1004-3667.2004.01.014>
- Zhang, R., & Deng, W. (2023). Motivation and engagement in vocational education. *Vocational Education and Training Journal*, 8(1), 55-70.
- Zhang, Y. L., & Geng, S. G. (2008). Tasks and Countermeasures of Higher Vocational Education in Building Ecological Civilization. *Journal of China Academy of Environmental Management*, 1, 1-4. <https://doi.org/10.13358/j.issn.1008-813x.2008.01.030>
- Zhao, W., & Suo, F. (2014). The cornerstones of sustainable learning. *Educational Research Review*, 9, 10-19.

Zhang, W. (2019). Industrial colleges and mixed ownership schools. *China Vocational and Technical Education*, 36(11), 67-79.

Zhao, X., & Cu, L. L. (2007). Discussion on school-enterprise cooperation mode of education. *China Adult Education*, 10, 25-26.

Zhou, J. (2017). Research on characteristics and countermeasures of higher vocational college students in the new era. *Western Leather*, 39(12), 242.

Zhou, Vijay. (2021). industry-education integration--a benign interaction between universities and regional economic synergistic development. *Journal of Chongqing Second Normal College*, 34(5), 110-114.

Appendices

Appendix A

List of Specialists and Letters of Specialists Invitation
for IOC Verification

List of Specialists Invitation for IOC Verification

NO.	Name	Position
1	Narongwat Mingmitr	Assoc.Prof.Dr of Bansomdejchaopraya Rajabhat University
2	Phisanu Bangkhoew	Asst.Prof.Dr. of Bansomdejchaopraya Rajabhat University
3	Luxana Keyuraphan	Asst.Prof.Dr. of Bansomdejchaopraya Rajabhat University
4	Qiu Yuan	Professor of HeYuan Polytechnic
5	Liao Yuanbing	Professor of HeYuan Polytechnic

List of Invitation Interview Experts

NO.	Name	Position
1	Sun Bin	Associate Professor of Shenzhen Polytechnic
2	Xu Hang	Professor of Shenzhen Polytechnic
3	Zhao Shuang	Professor of Guangdong Polytechnic of Light Industry
4	Chen Yanfang	Professor of HeYuan Polytechnic
5	Liao Yuanbing	Professor of HeYuan Polytechnic
6	Ye Feifei	Associate Professor of Shanwei Polytechnic
7	Li Peng	Associate Professor of Guangzhou Huali Polytechnic
8	Liu Ziqiang	Senior Engineer of Nongfu Spring Co., Ltd.
9	Liu Shaobo	Senior Engineer of Guangdong Yada Electronics Co., Ltd.
10	Liu Cangling	Engineer of Minglai Laser Intelligent Equipment (Heyuan) Co., Ltd.

List of Specialists Invitation for Strategies Evaluation

The following persons were invited as evaluation experts to evaluate the suitability and feasibility of the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province.

NO.	Name	Position
1	Sun Bin	Associate Professor of Shenzhen Polytechnic
2	Xu Hang	Professor of Shenzhen Polytechnic
3	Chen Yuanyuan	Associate Professor of Shenzhen Polytechnic
4	Yang Li	Professor of Shenzhen Polytechnic
5	Liu ShengLi	Associate Professor of Shenzhen Polytechnic
6	Zhao Shuang	Professor of Guangdong Polytechnic of Light Industry
7	Yang Haibing	Professor of Guangdong Polytechnic of Light Industry
8	Xiao Liping	Associate Professor of Guangdong Polytechnic of Light Industry
9	Yang Tao	Professor of Guangdong Polytechnic of Light Industry
10	Liu Chunlai	Associate Professor of Guangdong Polytechnic of Light Industry
11	Chen Yanfang	Professor of HeYuan Polytechnic
12	Liao Yuanbing	Professor of

NO.	Name	Position
13	Liao Yuanlai	HeYuan Polytechnic Associate Professor of HeYuan Polytechnic
14	Ye Hongwei	Associate Professor of HeYuan Polytechnic
15	Zhou Yongfu	Associate Professor of HeYuan Polytechnic
16	Ye Feifei	Associate Professor of Shanwei Polytechnic
17	Chen Heping	Associate Professor of Shanwei Polytechnic
18	Fu Qing	Associate Professor of Shanwei Polytechnic
19	Fang Qi	Professor of Shanwei Polytechnic
20	Zeng Hang	Associate Professor of Shanwei Polytechnic
21	Li Peng	Associate Professor of Guangzhou Huali Polytechnic
22	Qiu Zhihong	Associate Professor of Guangzhou Huali Polytechnic
23	He Zining	Professor of Guangzhou Huali Polytechnic
24	Lin Xiaolong	Associate Professor of Guangzhou Huali Polytechnic
25	Yang Tao	Associate Professor of Guangzhou Huali Polytechnic

Appendix B
Official Letter

MHESI 0643.14/ 2626



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Rajabhat University
1061 Soi Itsaraphap 15,
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10600

26 August, 2024

Subject Invitation to validate research instrument
Dear Asst.Prof.Dr.Luxana Keyuraphan

Regarding Mr. Wen Yuli with student code 6573139003, a doctoral student majoring in Sustainable Development Education Management at Bansorndejchaopraya Rajabhat University. The thesis is entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province" The thesis committee is as follows:

- | | |
|---|---------------|
| 1. Assistant Professor Dr. Phadet Kakham | Major Advisor |
| 2. Assistant Professor Dr. Areeya Juichamlong | Co-advisor |
| 3. Assistant Professor Dr. Sarayuth Sethakhajom | Co-advisor |

In this research, the researcher requires to check the content validity of the instrument to get the most complete research instrument. Knowing your experience in the field of the said research, the researcher would like to ask for your assistance in validating the said instrument. Your suggestions will be useful for improving the quality and suitability of research instruments for use in collecting data for this research.

Thank you for your kind considerations.

Yours faithfully

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26 August, 2024

Subject Invitation to validate research instrument
Dear Asst.Prof.Dr.Phisanu Bangkhoew

Regarding Mr. Wen Yuli with student code 6573139003, a doctoral student majoring in Sustainable Development Education Management at Bansorndejchaopraya Rajabhat University. The thesis is entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province" The thesis committee is as follows:

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| 2. Assistant Professor Dr. Areeya Juichamlong | Co-advisor |
| 3. Assistant Professor Dr. Sarayuth Sethakhajorn | Co-advisor |

In this research, the researcher requires to check the content validity of the instrument to get the most complete research instrument. Knowing your experience in the field of the said research, the researcher would like to ask for your assistance in validating the said instrument. Your suggestions will be useful for improving the quality and suitability of research instruments for use in collecting data for this research.

Thank you for your kind considerations.

Yours faithfully

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26 August, 2024

Subject Invitation to validate research instrument
Dear Assoc.Prof.Dr.Narongwat Mingmitr

Regarding Mr. Wen Yuli with student code 6573139003, a doctoral student majoring in Sustainable Development Education Management at Bansorndejchaopraya Rajabhat University. The thesis is entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province" The thesis committee is as follows:

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| 3. Assistant Professor Dr. Sarayuth Sethakhajorn | Co-advisor |

In this research, the researcher requires to check the content validity of the instrument to get the most complete research instrument. Knowing your experience in the field of the said research, the researcher would like to ask for your assistance in validating the said instrument. Your suggestions will be useful for improving the quality and suitability of research instruments for use in collecting data for this research.

Thank you for your kind considerations.

Yours faithfully

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26 August, 2024

Subject Invitation to join an interview as an expert
Dear Liu Cangling Engineer

Mr. Wen Yuli is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. He is undertaking research entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee as follows.

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| 2. Assistant Professor Dr. Areeya Juichamlong | Co-Advisor |
| 3. Assistant Professor Dr. Sarayuth Sethakhajorn | Co-Advisor |

The thesis advisory committee and the student have considered that you are an expert in this field. Therefore, Graduate School would like to invite you to be an expert to join the focus group discussion to provide the student with suggestions for his research.

Thank you for your kind considerations.

Yours faithfully

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26 August, 2024

Subject Invitation to join an interview as an expert
Dear Liu Shaobo Senior Engineer

Mr. Wen Yuli is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. He is undertaking research entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee as follows.

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| 3. Assistant Professor Dr. Sarayuth Sethakhajorn | Co-Advisor |

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Thank you for your kind considerations.

Yours faithfully

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26 August, 2024

Subject Invitation to join an interview as an expert
Dear Liu Ziqiang Senior Engineer

Mr. Wen Yuli is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. He is undertaking research entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee as follows:

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Thank you for your kind considerations.

Yours faithfully

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26 August, 2024

Subject Invitation to join an interview as an expert
Dear Li Peng Associate Professor

Mr. Wen Yuli is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. He is undertaking research entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee as follows.

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Thank you for your kind considerations.

Yours faithfully

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26 August, 2024

Subject Invitation to join an interview as an expert
Dear Ye Feifei Associate Professor

Mr. Wen Yuli is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. He is undertaking research entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee as follows.

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| 3. Assistant Professor Dr. Sarayuth Sethakhajorn | Co-Advisor |

The thesis advisory committee and the student have considered that you are an expert in this field. Therefore, Graduate School would like to invite you to be an expert to join the focus group discussion to provide the student with suggestions for his research.

Thank you for your kind considerations.

Yours faithfully

A handwritten signature in blue ink, appearing to be 'Tanaput'.

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26 August, 2024

Subject Invitation to join an interview as an expert
Dear Liao Yuanbing Professor

Mr. Wen Yuli is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansorndejchaopraya Rajabhat University. He is undertaking research entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee as follows.

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Thank you for your kind considerations.

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26 August, 2024

Subject Invitation to join an interview as an expert
Dear Chen Yanfang Professor

Mr. Wen Yuli is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. He is undertaking research entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee as follows.

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| 3. Assistant Professor Dr. Sarayuth Sethakhajorn | Co-Advisor |

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26 August, 2024

Subject Invitation to join an interview as an expert
Dear Zhao Shuang Professor

Mr. Wen Yuli is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. He is undertaking research entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee as follows.

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| 3. Assistant Professor Dr. Sarayuth Sethakhajorn | Co-Advisor |

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26 August, 2024

Subject Invitation to join an interview as an expert
Dear Xu Hang Professor

Mr. Wen Yuli is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. He is undertaking research entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee as follows.

- | | |
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26 August, 2024

Subject Invitation to join an interview as an expert
Dear Sun Bin Associate Professor

Mr. Wen Yuli is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. He is undertaking research entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee as follows.

- | | |
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Yours faithfully

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26 August, 2024

Subject Invitation to participate in the strategic assessment as an expert
Dear Yang Tao Associate Professor

Mr. Wen Yuli is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. He is undertaking research entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee as follows.

- | | |
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| 1. Assistant Professor Dr. Phadet Kakham | Major Advisor |
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Yours faithfully

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26 August, 2024

Subject Invitation to participate in the strategic assessment as an expert
Dear Lin Xiaolong Associate Professor

Mr. Wen Yuli is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. He is undertaking research entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee as follows.

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Yours faithfully

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26 August, 2024

Subject Invitation to participate in the strategic assessment as an expert
Dear He Zining Professor

Mr. Wen Yuli is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansordejchaopraya Rajabhat University. He is undertaking research entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee as follows.

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Yours faithfully

(Asst. Prof. Dr. Tanaput Chanchaoren)
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26 August, 2024

Subject Invitation to participate in the strategic assessment as an expert
Dear Qiu Zhihong Associate Professor

Mr. Wen Yuli is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. He is undertaking research entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee as follows.

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| 3. Assistant Professor Dr. Sarayuth Sethakhajorn | Co-Advisor |

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26 August, 2024

Subject Invitation to participate in the strategic assessment as an expert
Dear Li Peng Associate Professor

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26 August, 2024

Subject Invitation to participate in the strategic assessment as an expert
Dear Zeng Hang Associate Professor

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26 August, 2024

Subject Invitation to participate in the strategic assessment as an expert.
Dear Fang Qi Professor

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Dear Fu Qing Associate Professor

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Subject Invitation to participate in the strategic assessment as an expert
Dear Chen Heping Associate Professor

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Dear Ye Feifei Associate Professor

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Dear Zhou Yongfu Associate Professor

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Dear Ye Hongwei Professor

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26 August, 2024

Subject Invitation to participate in the strategic assessment as an expert
Dear Liao Yuanlai Associate Professor

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Subject Invitation to participate in the strategic assessment as an expert
Dear Liao Yuanbing Professor

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26 August, 2024

Subject Invitation to participate in the strategic assessment as an expert
Dear Chen Yanfang Professor

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26 August, 2024

Subject Invitation to participate in the strategic assessment as an expert
Dear Liu Chunlai Associate Professor

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26 August, 2024

Subject Invitation to participate in the strategic assessment as an expert
Dear Yang Lu Professor

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26 August, 2024

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Dear Xiao Liping Associate Professor

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Dear Yang Haibing Professor

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26 August, 2024

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Dear Zhao Shuang Professor

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26 August, 2024

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Dear Chen Yuanyuan Associate Professor

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26 August, 2024

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Dear Xu Hang Professor

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Subject Invitation to participate in the strategic assessment as an expert
Dear Sun Bin Associate Professor

Mr. Wen Yuli is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. He is undertaking research entitled "Sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee as follows.

- | | |
|--|---------------|
| 1. Assistant Professor Dr. Phadet Kakham | Major Advisor |
| 2. Assistant Professor Dr. Areeya Juichamlong | Co-Advisor |
| 3. Assistant Professor Dr. Sarayuth Sethakhajorn | Co-Advisor |

The thesis advisory committee and the student have considered that you are an expert in this field. Therefore, Graduate School would like to invite you to be an expert to join the focus group discussion to provide the student with suggestions for his research.

Thank you for your kind considerations.

Yours faithfully

(Asst. Prof. Dr. Tanaput Chanchaoren)
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Appendix C
Research Instrument

**Questionnaire on the Current Status of Industry-Education Integration
in Higher Vocational Colleges in Guangdong Province
(Students and Teachers)**

Description:

A questionnaire survey will be conducted on students and teachers of higher vocational colleges in Guangdong Province involved in industry-education integration to understand the current status and propose strategies conducive to its development.

There is no right or wrong answer to each question and answer in this questionnaire. Your answers are only used for statistical analysis and will never be processed or published separately. The information will be strictly confidential and will not be disclosed to anyone. You do not need to provide your name when filling out the questionnaire; please feel free to answer the questions.

Part I: Respondent Identity (Personal Information)

1. School:

Shenzhen Polytechnic

Guangdong Light Industry Vocational and Technical College

Heyuan Vocational and Technical College

Shanwei Vocational and Technical College

Guangzhou Huali Vocational College of Science and Technology

2. Gender:

Male

Female

3. Personnel Type:

Student

Teacher

Part 2 Questionnaire

Please read the following items carefully and select your understanding of the current status of industry-education integration in higher vocational colleges based on your actual situation and experience. Likert 5-point rating scale (1 = strongly disagree, 2 = somewhat disagree, 3 = don't understand, 4 = somewhat agree, 5 = strongly agree)

NO	The Current status of industry-education integration	Level				
		1	2	3	4	5
Governments' performance in industry-education integration						
1	The government is deeply involved in the school's industry-education integration project.					
2	The government plays a good role in promoting the school's industry-education integration.					
3	The government provides a complete system guarantee for the school's industry-education integration.					
4	The government provides sufficient financial support for the school's industry-education integration project.					
5	The government supports the school's industry-education integration project with sufficient human resources.					
6	The government provides other support for the school's industry-education integration project.					
Higher vocational colleges' performance in industry-education integration						
1	The school has a positive attitude towards promoting the industry-education integration.					
2	The school has sufficient financial investment in the industry-education integration.					
3	The school has a strong teaching staff in the industry-education of integration.					

NO	The Current status of industry-education integration	Level				
		1	2	3	4	5
4	The school's implementation plan for the industry-education integration policy has been improved.					
5	The school's industry-education integration courses or activities are consistent with actual work needs.					
6	The school's integration of industry and education in talent cultivation (professional setting, curriculum construction, internship training, etc.) has achieved good results.					
7	The school's integration of industry and education in teaching team construction (front-line practice, part-time tutors, etc.) is good.					
8	The school's construction of an industry-education integration platform (industrial colleges, internship training bases, etc.) has achieved good results.					
Enterprises' performance in industry-education integration						
1	Enterprises are moderately and deeply involved in industry-education integration projects.					
2	Enterprises have a positive attitude in promoting industry-education integration.					
3	Enterprises have played an active role in student internships and employment in the industry-education integration.					
4	Enterprises provide sufficient funds for industry-education integration.					
5	The company provides sufficient human resources for industry-education integration.					
6	Enterprises provide sufficient equipment for the industry-education integration					
Students' performance in industry-education integration						
1	The industry-education integration is of great help to the study					

NO	The Current status of industry-education integration	Level				
		1	2	3	4	5
	and future of higher vocational students.					
2	The industry-education integration can help higher vocational students better understand professional knowledge.					
3	The industry-education integration can help higher vocational students better understand the work environment.					
4	Integrating industry-education can enable higher vocational students to understand corporate job requirements better.					
5	The industry-education integration can significantly improve the employment competitiveness of higher vocational students					
6	Students are willing to participate in activities that integrate industry and education					

Interview Form for Sustainable Development Strategy of Industry-Education Integration in Higher Vocational Colleges in Guangdong Province (Educational Administrators, Senior Enterprise Managers)

Description:

This study interviewed 10 Educational Administrators from 5 higher vocational colleges and 6 senior enterprise managers from 3 enterprises. Educational Administrators must meet the following conditions: 1) have worked in the school for more than 5 years; 2) be responsible for school-enterprise cooperation, industry-education integration, and other specific work; 3) must be willing to participate in structured interview recordings; 4) must be willing to review interview records for verification.

Senior enterprise managers must meet the following requirements: 1) the enterprise and higher vocational colleges are in school-enterprise cooperation; 2) senior enterprise managers involved in the formulation of enterprise development policies; 3) must be willing to participate in structured interview recordings; 4) must be willing to review interview records for verification.

Part I: Interviewee Identity (Personal Information)

1. Name (Interviewee):
2. Position:
3. Work Unit:
4. Interview Date:
5. Interview Duration:

Part II Interview Outline

Content	Questions
Governments in the industry-education integration	1. Given the current situation of Guangdong Province's higher vocational colleges regarding industry-education integration, what strategies should the government adopt to improve industry-education integration?
Higher vocational colleges in the industry-education integration	2. Given the current situation of Guangdong Province's higher vocational colleges regarding industry-education integration, what strategies should Higher vocational colleges adopt to improve industry-education integration?
Enterprises in the industry-education integration	3. Given the current situation of Guangdong Province's higher vocational colleges regarding industry-education integration, what strategies should enterprises adopt to improve industry-education integration?
Students in the industry-education integration	4. Given the current situation of students in Guangdong Province's higher vocational colleges regarding industry-education integration, what strategies should students adopt to improve industry-education integration?

**Questionnaire validity evaluation form for the current status of
industry-education integration development in higher vocational
colleges in Guangdong Province**

Research title: Research on sustainable development strategies for industry-education integration in higher vocational colleges in Guangdong Province

Research purpose:

1. Study the current status of industry-education integration development in higher vocational colleges in Guangdong Province.
2. Formulate strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.
3. Evaluate the suitability and feasibility of strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.

Assessor name:

Title/position:

Work unit:

Years of work experience:

When using the questionnaire, please evaluate whether the contents of the questionnaire about the actual perception of the current status of industry-education integration development in higher vocational colleges in Guangdong Province by students and teachers in higher vocational colleges in Guangdong Province are consistent. After the evaluation, please tick the corresponding box. Please evaluate according to the following criteria: -1=does not match the definition, 0=not sure whether it meets the definition, +1=corresponds to it.

NO	The Current status of industry-education integration	Evaluation result		
		-1	0	1
Information about the identity of the Interviewer				
1	School: Shenzhen Polytechnic <input type="checkbox"/> Guangdong Light Industry Vocational and Technical College <input type="checkbox"/> Heyuan Vocational and Technical College <input type="checkbox"/> Shanwei Vocational and Technical College <input type="checkbox"/> Guangzhou Huali Vocational College of Science and Technology <input type="checkbox"/>			
2	Gender: Male <input type="checkbox"/> Female <input type="checkbox"/>			
3	Personnel Type: Student <input type="checkbox"/> Teacher <input type="checkbox"/>			
Governments' performance in industry-education integration				
1	The government is deeply involved in the school's industry-education integration project.			
2	The government plays a good role in promoting the school's industry-education integration.			
3	The government provides a complete system guarantee for the school's industry-education integration			
4	The government provides sufficient financial support for the school's industry-education integration project			
5	The government provides sufficient human resources support for the school's industry-education integration project			

NO	The Current status of industry-education integration	Evaluation result		
		-1	0	1
6	The government provides other support for the school's industry-education integration project			
Higher vocational colleges' performance in industry-education integration				
1	The school has a positive attitude towards promoting industry-education integration.			
2	The school has sufficient funds for industry-education integration.			
3	The school has a strong faculty in industry-education integration.			
4	The school has a perfect incentive policy for industry-education integration.			
5	The school's industry-education integration courses or activities align with actual work needs.			
6	The school's industry-education integration talent training (professional setting, curriculum construction, internships, etc.) is practical.			
7	The school's industry-education integration faculty team construction (front-line practice, part-time tutors, etc.) is good.			
8	The school's industry-education integration platform construction (industry college, internship training base, etc.) is effective.			
Enterprises' performance in the industry-education integration				
1	Enterprises are deeply involved in the industry-education integration project.			
2	Enterprises have a positive attitude in promoting the industry-education integration process.			

NO	The Current status of industry-education integration	Evaluation result		
		-1	0	1
3	Enterprises play an active role in the internship and employment of students in the industry-education integration.			
4	Enterprises provide sufficient funds for industry-education integration.			
5	Enterprises provide sufficient human resources for industry-education integration.			
6	Enterprises provide sufficient equipment for industry-education integration.			
Students' performance in the industry-education integration				
1	The industry-education integration is of great help to the study and future of higher vocational students.			
2	The industry-education integration can help higher vocational students better understand professional knowledge.			
3	The industry-education integration can help higher vocational students better understand the work environment.			
4	Integrating industry-education can enable higher vocational students to better understand corporate job requirements.			
5	The industry-education integration can significantly improve the employment competitiveness of higher vocational students.			
6	Students are willing to participate in activities that integrate industry and education.			

Signature:

Date:

Effectiveness Evaluation Form of Interview Outline on Sustainable Development Strategy of Industry-Education Integration in Higher Vocational Colleges in Guangdong Province

Research Title: Strategies for the Sustainable Development of Industry-Education Integration in Higher Vocational Colleges in Guangdong Province

Research Purpose:

1. Study the current status of industry-education integration development in higher vocational colleges in Guangdong Province.
2. Formulate strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province.
3. Evaluate the suitability and feasibility of improving the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province.

Assessor Name:

Title/Position:

Work Unit:

When using the interview, please evaluate whether the interview is correct about the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province. After the evaluation, please tick the corresponding box. Please evaluate according to the following criteria: -1=does not match the definition, 0=not sure whether it meets the definition, +1=corresponds to it.

Content	Questions	Evaluation result		
		-1	0	1
Governments in the industry-education integration	1. Given the current situation of Guangdong Province's higher vocational colleges regarding industry-education integration, what strategies should the government adopt to improve industry-education integration?			
Higher vocational colleges in the industry-education integration	2. Given the current situation of Guangdong Province's higher vocational colleges regarding industry-education integration, what strategies should Higher vocational colleges adopt to improve industry-education integration?			
Enterprises in the industry-education integration	3. Given the current situation of Guangdong Province's higher vocational colleges regarding industry-education integration, what strategies should enterprises adopt to improve industry-education integration?			
Students in the industry-education integration	4. Given the current situation of students in Guangdong Province's higher vocational colleges regarding industry-education integration, what strategies should students adopt to improve industry-education integration?			

Suggestion:

Signature:

Date:

Evaluation Form for Sustainable Development Strategy of Industry-Education Integration in Higher Vocational Colleges in Guangdong Province

Description:

1. This Validity Evaluation Form for Factor Interview Form of Sustainable Development Strategy of Industry-Education Integration in Higher Vocational Colleges in Guangdong Province is a form for experts to consider the consistency of the questionnaire and solicit opinions. It is part of the doctoral dissertation on Educational Management of Bansongdechaopraya Rajabhat University, Thailand. The purpose of this study is to explore the current status of sustainable development of industry-education integration in higher vocational colleges in Guangdong Province, formulate sustainable development strategies of industry-education integration in higher vocational colleges in Guangdong Province, and evaluate the sustainable development strategies of industry-education integration in higher vocational colleges in Guangdong Province.

2. This questionnaire validity evaluation form focuses on 4 aspects, including all strategies.

3. Your comments on the interview validity evaluation form will help formulate the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province. Answering this questionnaire will not have any impact on you. The data provided will be used as an overview, and the researcher intends to use the data for research purposes only.

I appreciate your cooperation in answering the validity of this evaluation form.

Mr.Wen Yuli

Bansomdejchaopraya Rajabhat
University

Evaluation checklist	Suitability					Feasibility				
	5	4	3	2	1	5	4	3	2	1
Regularly hold industry-education integration lectures, seminars, company open days, and other activities to provide students with sufficient internship and training opportunities.										
Continue to pay attention to policy trends, technological innovations, and changes in market demand.										
Provide sufficient human resources to meet the needs of industry-education integration.										
4. Strategies at the student level										
Actively participate in internships, practical training, extracurricular practice, innovation and entrepreneurship, and other activities.										
Actively communicate and exchange with enterprises and pay attention to market demand and industry trends.										
Continuously improve professional and practical abilities and obtain skills or professional qualification certificates.										
Continuously strengthen independent learning, humanistic qualities, teamwork, innovation, and entrepreneurship capabilities.										

Suggestions

.....

.....

.....

.....

Sign..... Assessor

(.....)

Date...../...../.....

Appendix D
The Results of the Quality Analysis of Research
Instruments

The Quality Analysis Results of Research Instruments

This is the Results of quality evaluation of the questionnaire on the current status of the industry-education integration in higher vocational colleges in Guangdong Province.

clause	The Current status of industry-education integration	Experts					IOC	Conclusion
		1	2	3	4	5		
Information about the identity of the Interviewer								
1	School	1	1	1	1	1	1.00	consistent
2	Gender	1	1	1	1	1	1.00	consistent
3	Personnel Type	1	1	1	1	1	1.00	consistent
Governments' performance in industry-education integration								
4	The government is deeply involved in the school's industry-education integration project	1	1	1	1	1	1.00	consistent
5	The government plays a good role in promoting the school's industry-education integration	1	1	1	1	1	1.00	consistent
6	The government provides a complete system guarantee for the school's industry-education integration	1	1	1	1	1	1.00	consistent
7	The government provides sufficient financial support for the school's industry-education integration project	1	1	1	1	1	1.00	
8	The government provides sufficient human resources support for the school's industry-education integration project	1	1	1	1	1	1.00	consistent
9	The government provides other support for the school's industry-education integration project	1	1	1	1	1	1.00	consistent
The school's performance in the industry-education integration								
10	The school has a positive attitude towards promoting industry-education integration	1	1	1	1	1	1.00	consistent
11	The school has sufficient funds for industry-education integration	1	1	1	1	1	1.00	consistent

clause	The Current status of industry-education integration	Experts					IOC	Conclusion
		1	2	3	4	5		
12	The school has strong faculty in industry-education integration	1	1	1	1	1	1.00	consistent
13	The school has a perfect incentive policy for industry-education integration	1	1	1	1	1	1.00	consistent
14	The school's industry-education integration courses or activities are in line with actual work needs	1	1	1	1	1	1.00	consistent
15	The school's industry-education integration talent training (professional setting, curriculum construction, internships, etc.) is effective	1	1	1	1	1	1.00	consistent
16	The school's industry-education integration faculty team construction (front-line practice, part-time tutors, etc.) is good	1	1	1	1	1	1.00	consistent
17	The school's industry-education integration platform construction (industry college, internship training base, etc.) is effective	1	1	1	1	1	1.00	consistent
Enterprises' performance in the industry-education integration								
18	Enterprises are deeply involved in the industry-education integration project	1	1	1	1	1	1.00	consistent
19	Enterprises have a positive attitude in promoting the industry-education integration process	1	1	1	1	1	1.00	consistent
20	Enterprises play an active role in the internship and employment of students in the industry-education integration	1	1	1	1	1	1.00	consistent
21	Enterprises provide sufficient funds for the industry-education integration	1	1	1	1	1	1.00	consistent
22	Enterprises provide sufficient human resources for the industry-education integration	1	1	1	1	1	1.00	consistent
23	Enterprises provide sufficient equipment for the industry-education integration	1	1	1	1	1	1.00	consistent
Students' performance in the industry-education integration								
25	The industry-education integration is of great help to	1	1	1	1	1	1.00	consistent

clause	The Current status of industry-education integration	Experts					IOC	Conclusion
		1	2	3	4	5		
	the study and future of higher vocational students							
26	The industry-education integration can help higher vocational students better understand professional knowledge	1	1	1	1	1	1.00	consistent
27	The industry-education integration can help higher vocational students better understand the actual work environment	1	1	1	1	1	1.00	consistent
28	The industry-education integration can enable higher vocational students to better understand corporate job requirements	1	1	1	1	1	1.00	consistent
29	The industry-education integration can significantly improve the employment competitiveness of higher vocational students	1	1	1	1	1	1.00	consistent
30	Students are willing to participate in activities that integrate industry and education	1	1	1	1	1	1.00	consistent

3. The quality analysis results of Interview.

Content	Questions	Experts					IOC	Conclusion
		1	2	3	4	5		
Governments in the industry-education integration	4. Given the current situation of Guangdong Province's higher vocational colleges in terms of industry-education integration, what strategies should the government adopt to improve industry-education integration?	1	1	1	1	1	1.00	consistent
Higher vocational colleges in the industry-education integration	2. Given the current situation of Guangdong Province's higher vocational colleges in terms of industry-education integration, what strategies should Higher vocational colleges adopt to improve industry-education integration?	1	1	1	1	1	1.00	consistent
Enterprises in the industry-education integration	3. Given the current situation of Guangdong Province's higher vocational colleges in terms of industry-education integration, what strategies should enterprises adopt to improve industry-education integration?	1	1	1	1	1	1.00	consistent
Students in the industry-education integration	4. Given the current situation of students in Guangdong Province's higher vocational colleges in terms of industry-education integration, what strategies should students adopt to improve industry-education integration?	1	1	1	1	1	1.00	consistent

Reliability analysis of research instruments

Reliability (Students)

Cronbach reliability analysis results		
Number of items	Sample size	Cronbach α
26	384	0.959

From the above table, we can see that the reliability coefficient α value is 0.959, which is greater than 0.9, which means that the reliability quality of the research data is very high.

Reliability (Teachers)

Cronbach reliability analysis results		
Number of items	Sample size	Cronbach α
26	361	0.955

From the above table, we can see that the reliability coefficient α value is 0.955, which is greater than 0.9, which means that the reliability quality of the research data is very high.

Explanation: Analyze the α coefficient. If this value is higher than 0.8, it means that the reliability is high; if this value is between 0.7 and 0.8, it means that the reliability is good; if this value is between 0.6 and 0.7, it means that the reliability is acceptable; if this value is less than 0.6, it means that the reliability is poor;

Results of variable reliability correlation analysis

Validity (Students)

Validity analysis results	
Valid samples	384
KMO value	0.948
Bartlett sphericity value	8275.044
<i>df</i>	325
<i>p</i> value	0.000

Use KMO and Bartlett test for validity verification. From the table above, we can see that the KMO value is 0.933 and the KMO value is greater than 0.8. The research data is very suitable for extracting information (which reflects the good validity from the side).

Validity (Teacher)

Validity analysis results	
Valid samples	361
KMO value	0.933
Bartlett sphericity value	9276.247
<i>df</i>	325
<i>p</i> value	0.000

Use KMO and Bartlett test for validity verification. From the above table, we can see that: KMO value is 0.933, KMO value is greater than 0.8, the research data is very suitable for extracting information (from the side, it reflects that the validity is very good).

Explanation: KMO value; If this value is higher than 0.8, it means that the research data is very suitable for extracting information (from the side, it reflects that the validity is excellent); if this value is between 0.7~0.8, it means that the research data is suitable for extracting information (from the side, it reflects that the validity is good); if this value is between 0.6~0.7, it means that the research data is relatively suitable for extracting information (from the side, it reflects that the validity is average); if this value is less than 0.6, it means that the data is not suitable for extracting information

The Record of Interview Results

Interviewee 1

1. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should the government adopt to enhance industry-education integration?

Given the current situation, I suggest that the government adopt the following strategies to enhance industry-education integration: First, formulate and implement policies to support industry-education integration, provide policy guarantees and financial support, establish reward and incentive mechanisms, and encourage cooperation between enterprises and higher vocational colleges. Second, increase economic investment in industry-education integration projects, support cooperation projects and training practice bases between higher vocational colleges and enterprises, set up special funds for industry-education integration, subsidize innovative education models and practice projects, and promote education reform and industrial upgrading. Third, build a government-led industry-education integration platform to encourage communication and cooperation between enterprises, higher vocational colleges, and the government, regularly hold school-enterprise matchmaking meetings and industry-education integration forums, and promote in-depth cooperation between enterprises and higher vocational colleges. Fourth, promote vocational education reform, improve education quality and practicality, enhance students' employability and professional quality, support the establishment of a talent training system that connects with industry needs, and ensure that graduates can adapt to market demand.

2. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should higher vocational colleges adopt to improve industry-education integration?

Given the current situation, I suggest that higher vocational colleges adopt the following strategies to enhance industry-education integration: First, higher vocational colleges should deepen industry-university cooperation, establish long-

term cooperative relations with enterprises, sign strategic cooperation agreements, form a stable network of partners, encourage enterprises to participate in course design and teaching process, and ensure that the course content matches the needs of the industry. Second, higher vocational colleges should optimize the curriculum system, timely update and adjust the curriculum according to the development trends of the industry and the needs of enterprises, increase practical courses and training links, introduce project-based teaching mode, encourage students to participate in real projects, and enhance practical ability. Third, higher vocational colleges should strengthen the construction of teaching staff, encourage teachers to practice in enterprises, obtain first-hand industry information, enhance the practicality of teaching, hire industry experts and enterprise technicians as part-time teachers, and improve the quality of education. Fourth, higher vocational colleges should strengthen the construction of internship and training bases, build training bases jointly run with enterprises, provide real working environments and conditions, enhance students' practical ability, set up demonstration bases for industry-education integration, and promote more enterprises to participate through typical cases.

3. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should enterprises adopt to enhance this integration?

Given the current situation, I suggest that enterprises adopt the following strategies to enhance industry-education integration: First, enterprises should establish long-term cooperative relations with higher vocational colleges, participate in the development of courses and teaching syllabi, jointly launch training projects, and ensure that the educational content is aligned with the actual needs of enterprises. Second, enterprises should build training bases within the enterprise to carry out skills training and career guidance to enhance students' practical ability. Third, enterprises should send experienced employees to serve as enterprise mentors to guide students' learning and practice and share industry experience. Fourth, enterprises should subsidize higher vocational colleges and enterprise-related education and research projects, cooperate with higher vocational colleges

to develop new technologies and products, promote the connection between academic research and enterprise needs, and help enterprises with technological innovation and industrial upgrading. Fifth, regularly hold enterprise open day activities to let students understand enterprises' operations and working environment and increase their sense of identity with enterprises.

4. Given the current situation of students in higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should students in higher vocational colleges adopt to improve industry-education integration?

Given the current situation, I suggest that students in higher vocational colleges adopt the following strategies to improve industry-education integration: actively participate in off-campus internships and corporate training and have a deep understanding of the actual job positions and working environment in the industry; actively learn the latest development trends and technical dynamics in the professional field to improve professional skills; actively obtain professional qualification certificates related to the major to enhance employment competitiveness; strengthen independent learning ability, and make full use of Internet learning platforms, online courses and other self-study professional new knowledge.

Interviewee 2

1. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should the government adopt to improve industry-education integration?

Given the current situation, I suggest that the government adopt the following strategies to enhance the industry-education integration: formulate an industry-education integration development plan, clarify development objectives, tasks, and policy measures, and formulate relevant policy measures such as certification standards and evaluation methods for industry-education integration enterprises to provide policy guarantees and support for industry-education integration. Promote

the integration and sharing of educational and industrial resources, and promote in-depth cooperation between higher vocational colleges and enterprises by building an industry-education integration platform and establishing an information-sharing mechanism. Formulate incentive policies to encourage higher vocational colleges and enterprises to actively participate in the industry-education integration, including providing financial subsidies, tax incentives, financial support, and other incentives to reduce the costs and risks of higher vocational colleges and enterprises participating in the industry-education integration. Establish an industry-education integration evaluation mechanism to evaluate and assess higher vocational colleges and enterprises participating in the industry-education integration, and encourage schools and enterprises to continuously improve the industry-education integration through the regular release of evaluation reports and evaluated results, and improve the quality and effectiveness of the industry-education integration.

2. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should higher vocational colleges adopt to improve industry-education integration?

Given the current situation, higher vocational colleges can adopt the following strategies for industry-education integration: build more high-quality internship and training bases and ensure that students can practice in a real working environment. Invite corporate professionals to serve as mentors for practical courses, providing practical operation guidance and career development suggestions. According to the latest trends and technologies in the development of the industry, the course content should be updated promptly to ensure the forward-looking and practical nature of the teaching content. Introduce real cases of enterprises in teaching so students can master theoretical knowledge in analyzing and solving practical problems. Encourage and support teachers to practice in enterprises, enhance teachers' industry experience and practical ability, and thus improve teaching quality. Regularly hold teacher training for industry development to enhance teachers' understanding of the latest industry trends and teaching ability. Actively seek policy support and financial investment from the government and relevant

departments to develop industry-education integration projects and infrastructure construction.

3. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should enterprises adopt to improve industry-education integration?

Given the current situation, enterprises should adopt the following strategies to improve industry-education integration: Provide students with high-quality internship opportunities to gain practical experience in a real working environment. Support students in undertaking enterprise-related innovation projects and research and provide technical support and resources. Regularly hold industry lectures and seminars in higher vocational colleges and invite experts to share industry trends and technical dynamics. Strengthen cooperation with higher vocational colleges, send enterprise technical backbones to higher vocational colleges to become enterprise mentors, and participate in the talent training process. Integrate corporate culture and values into the education process so that students can understand corporate culture and industry standards during the learning process.

4. Given the current status of students in higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should students in higher vocational colleges adopt to improve industry-education integration?

Given the current situation, I think that students in higher vocational colleges can adopt the following strategies for industry-education integration: actively participate in the industry-education integration held by schools and enterprises and improve the ability to solve practical problems through project practice; actively participate in internship and training courses, combine classroom knowledge with practical operations, and better understand the professional knowledge and actual working environment; actively seek guidance and advice from experienced mentors in schools, understand the forefront of the industry and academic trends; work hard to learn professional knowledge, master a solid professional theoretical foundation,

and prepare for participating in the industry-education integration activities; actively participate in skill competitions to improve their professional skills.

Interviewee 3

1. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should the government adopt to enhance industry-education integration?

Given the current situation, I suggest that the government adopt the following strategies to enhance industry-education integration: First, accelerate the improvement of relevant laws and regulations on vocational education and industry-education integration, clarify the rights and responsibilities of all parties, and provide solid legal guarantees for industry-education integration. Second, incentives such as tax and financial subsidies should be provided to reduce the costs and risks of schools and enterprises participating in industry-education integration and encourage more subjects to participate actively. Third, increase financial investment and support, set up a special fund for industry-education integration, increase financial allocations for vocational education and industry-education integration, and attract social capital to invest in the field of industry-education integration through government-guided funds, PPP models, etc., to support key links such as industry-education integration projects, training base construction, and teacher team construction. Fourth, a school-enterprise cooperation platform should be built to promote information exchange and cooperation between schools and enterprises, reduce cooperation costs, and improve cooperation efficiency. Fifth, higher vocational colleges and enterprises should be encouraged to carry out talent training jointly, jointly formulate talent training plans, develop curriculum materials, build training bases, etc., to achieve a close connection between talent training and industry needs. Sixth, an industry-education integration evaluation system should be established, the work of industry-education integration should be regularly evaluated and assessed, and the supervision and inspection of industry-education integration should be increased to ensure that various policies and measures are effectively implemented.

2. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should higher vocational colleges adopt to improve industry-education integration?

Higher vocational colleges can adopt the following strategies to improve industry-education integration: First, participate in formulating and optimizing relevant policies on industry-education integration and provide policy guarantees for the industry-education integration of higher vocational colleges. Second, regularly collect feedback from enterprises, students, and teachers on implementing industry-education integration and timely adjust and improve relevant measures. Third, financial investment should be increased to strengthen the construction of school internships and training bases and provide students with more practical opportunities. Fourth, introduce enterprise mentors and work cases, integrate enterprises' actual production work experience into the classroom, and let students genuinely understand the working environment and enterprise job requirements. Fifth, formulate scientific and reasonable evaluation standards for industry-education integration, conduct comprehensive evaluations of school-enterprise cooperation projects, internships, and training teaching, etc., regularly collect feedback from enterprises, students, and teachers on the implementation of industry-education integration, and timely adjust talent training plans and improve relevant measures to enhance the effect of industry-education integration.

3. Given the current status of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should enterprises adopt to improve industry-education integration?

Given the current situation, I suggest that enterprises adopt the following strategies to improve industry-education integration: First, enterprises should jointly build internship and training bases with higher vocational colleges to provide students with a real working environment and practical opportunities, and at the same time use the school's scientific research resources and talent advantages to solve practical problems for enterprises. Second, enterprises should jointly formulate talent training programs with higher vocational colleges, develop curriculum

materials, and implement order training, modern apprenticeship, and other models to ensure that talent training is closely connected with industrial needs. Third, enterprises should strengthen cooperation with higher vocational colleges and scientific research institutions, promote the transformation of scientific research results into real productivity, and enhance enterprises' technological innovation capabilities and market competitiveness. Fourth, enterprises should reasonably invest human, material, financial, and other resources according to the actual needs of the cooperation projects to ensure smooth progress. Fifth, enterprises should strengthen information sharing with higher vocational colleges, scientific research institutions, and other partners, pay attention to industry dynamics and market changes, and provide strong support for the adjustment and optimization of cooperation projects.

4. Given the current situation of students in higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should students in higher vocational colleges adopt to improve industry-education integration?

I think students in higher vocational colleges can adopt the following strategies to improve industry-education integration: First, make full use of the industry-education integration platform, training base and other resources provided by the school, and actively participate in various training and practical activities; second, during the internship and training process, actively establish a good relationship with corporate mentors and colleagues, take the initiative to communicate, and understand corporate culture and industry development trends; third, take the initiative to participate in social practice and corporate internship activities organized by the school, truly experience the actual working environment of the enterprise, and understand job requirements; fourth, while paying attention to professional skills training, strengthen the improvement of humanistic literacy, cultivate good professional ethics, communication skills, teamwork and other comprehensive qualities, and enhance employment competitiveness.

Interviewee 4

1. Given the current status of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should the government adopt to improve industry-education integration?

Given the current situation, the government should adopt the following strategies to improve industry-education integration: The government should formulate an overall plan and implementation plan, introduce relevant supporting policies, and create a good institutional environment. Set up special funds to support industry-education integration projects, give tax incentives to enterprises participating in industry-education integration, and guide social capital to invest in vocational education. Set up an industry guidance committee, establish a school-enterprise cooperation mechanism of "joint construction of majors, courses, and training bases," and encourage industry enterprises to participate deeply in the whole process of talent training. The government should strengthen the construction of talent teams in industry-education integration, cultivate a group of compound talents who understand education, industry, and management, and provide strong talent support for industry-education integration. Incorporate the work of industry-education integration into the performance appraisal of relevant departments and local governments, establish a third-party evaluation mechanism, and guide all parties to form a joint force.

2. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should higher vocational colleges adopt to improve industry-education integration?

Given the current situation, higher vocational colleges can adopt the following strategies to improve industry-education integration: schools and enterprises jointly invest in constructing training bases to provide students with real production environments and practical opportunities. Schools and enterprises jointly develop professional courses and teaching materials to ensure the course content is closely connected to industry needs. They also introduce real cases and practical experiences of enterprises to make the course content more targeted and valuable.

Schools and enterprises can also implement talent training models such as order training and apprenticeship, customize training programs according to enterprise needs, achieve synchronization of enrollment and recruitment, synchronization of teaching and production, and integration of internship and employment so that students can quickly adapt to the job needs of enterprises after graduation. Schools should strengthen the construction of "dual-qualified" teaching teams, encourage teachers to practice in enterprises, and improve teachers' practical teaching ability and professional quality. At the same time, enterprise experts and technical backbones can also be hired to teach part-time or guide practical teaching in schools. Schools and enterprises should jointly organize industry-university-research cooperation projects to strengthen scientific and technological research, development, and achievement transformation. Through joint application of scientific research projects and co-construction of scientific research platforms, scientific and technological innovation and achievement transformation will be promoted to support industrial development.

3. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should enterprises adopt to enhance industry-education integration?

Given the current situation, enterprises should adopt the following strategies to enhance industry-education integration: Enterprises should pay close attention to the national and local policy dynamics and adjust cooperation strategies and directions promptly to adapt to policy orientations and market demand changes. Enterprises can establish long-term cooperative relationships with colleges and vocational schools, jointly develop education and training plans, and achieve resource sharing. By signing a strategic cooperation agreement, the responsibilities and objectives of both parties are determined. Enterprises can participate in the design and development of courses to ensure that the course content is closely integrated with industry needs and cultivate talents that better meet the actual needs of enterprises. Enterprises can provide students with internship and training opportunities, set up off-campus practice bases, let students learn and practice in a real working environment, and improve their employability. A corporate mentor

system can be established to invite professional talents from enterprises to serve as instructors for colleges and universities to help students understand industry trends and job-seeking skills and improve students' professional literacy. Enterprises can also jointly carry out scientific research projects with higher vocational colleges, provide financial and technical support, combine scientific research with actual problems of enterprises, solve enterprise problems, and promote technological innovation.

4. Given the current status of students in higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should students in higher vocational colleges adopt to improve industry-education integration?

Given the current situation, I think that students in higher vocational colleges can adopt the following strategies for industry-education integration: actively seek internship opportunities related to their majors, actively participate in internships and practical activities, improve their professional skills and practical operation capabilities through practice, and strengthen their connections with enterprises. Through school-enterprise cooperation projects, industry lectures, and other activities, actively communicate with enterprise representatives, understand industry needs and development trends, and improve their professional qualities. According to their interests and industry development trends, formulate a reasonable career development plan, clarify future employment objectives, and enhance their competitiveness. Actively join various practice clubs or projects of the school, participate in actual project management and teamwork, and exercise their comprehensive abilities.

Interviewee 5

1. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should the government adopt to improve industry-education integration?

Given the current situation, I suggest that the government adopt the following strategies to improve industry-education integration: First, formulate and implement relevant policies to encourage enterprises to establish cooperative relations with higher vocational colleges, provide financial subsidies and tax incentives, and enable enterprises to participate in talent training. Second, increase investment in vocational education, improve higher vocational colleges' school conditions and teaching facilities, and enhance their attractiveness and competitiveness. Third, an information platform for industry-education integration should be established to promote information exchange and resource sharing between the government, enterprises, and higher vocational colleges, as well as promote the implementation of cooperation projects. Fourth, training and seminars on industry-education integration should be regularly organized to encourage exchanges among all parties and share best practices and success stories. Fifth, establish an evaluation system for industry-education integration, periodically evaluate the implementation effects of various policies and measures, collect feedback from all parties, and adjust policies promptly.

2. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should higher vocational colleges adopt to improve industry-education integration?

Given the current situation, I think higher vocational colleges can adopt the following strategies to improve industry-education integration: First, higher vocational colleges should establish a closer cooperative relationship with enterprises, not only limited to the construction of internship and training bases but also jointly develop course materials, implement joint training projects, etc., to ensure that talent training is closely connected with industry needs. Second, higher vocational colleges can unite enterprises, scientific research institutions, industry associations, and other forces to jointly establish an industry-education integration community, realize resource sharing and complementary advantages, and promote industry-education integration to a deeper level. Third, higher vocational colleges can promote talent training models such as modern apprenticeship and order classes. Through models such as modern apprenticeship and order classes, the deep integration of school

education and enterprise practice can be achieved, allowing students to learn and grow in the real working environment of the enterprise and improve their professional quality and practical ability. Fourth, higher vocational colleges should actively seek policy support from the national and local governments, including financial subsidies and tax incentives, to provide strong guarantees for integrating industry and education. Fifth, higher vocational colleges should also strengthen the publicity and promotion of the policy of industry-education integration, improve the awareness and attention of all sectors of society to the industry-education integration, and form a good social atmosphere. Sixth, higher vocational colleges should also pay close attention to changes in market demand, adjust professional settings and course content promptly, and ensure that talent training is consistent with market demand. Seventh, an industry-education integration coordination organization should be established to be responsible for school-enterprise cooperation and industry-education integration matters, and resource sharing and information exchange should be promoted.

3. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should enterprises adopt to improve industry-education integration?

Given the current situation, I suggest that enterprises adopt the following strategies to improve industry-education integration: First, enterprises should take the initiative to connect with higher vocational colleges, establish a regular communication mechanism, clarify talent needs and job requirements, and provide guidance and feedback for talent training in higher vocational colleges. Second, enterprises should send experts to work with teachers from higher vocational colleges to study and formulate talent training plans, provide information such as industry development trends and technology application prospects, and ensure that training objectives match job requirements. Third, enterprises should use their facilities, equipment, and other resources to build on-campus or off-campus internship training bases with higher vocational colleges so that students can learn and practice in a real working environment. Fourth, enterprises should select employees with strong business capabilities and a strong sense of responsibility as

part-time teachers, participate in teaching, guiding internships and training, and introduce enterprise elements. Fifth, enterprises should invite teachers and students from higher vocational colleges to participate in enterprise technology research, use the scientific research advantages of higher vocational colleges to solve actual production problems and realize the integration of production, learning, and research. Sixth, support and participate in vocational colleges' vocational skills appraisal and skills competitions, promote teaching and learning through competitions, and improve talent training quality.

4. Given the current situation of students in higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should students in higher vocational colleges adopt to improve industry-education integration?

Given the current situation, I think students in higher vocational colleges can adopt the following strategies to improve industry-education integration: First, use spare time to learn skills related to the major, such as participating in professional qualification certification training, online courses, etc., to improve their professional skills. Second, actively participate in internships and training courses organized by the school and go to enterprises to understand the job requirements and working environment. Third, strive to master the practical skills of the major, participate in various skill competitions and club activities, and cultivate hands-on ability. Fourth, online resources and book materials should be used for independent learning on industry development trends and new technologies.

Interviewee 6

1. Given the current situation of higher vocational colleges in Guangdong Province regarding the industry-education integration, what strategies should the government adopt to enhance the industry-education integration?

Given the current situation, the government should adopt the following strategies to enhance industry-education integration: First, the government should introduce relevant policies to clarify the direction and objectives of integrating

industry and education and provide a cooperation framework for enterprises and educational institutions. Through financial subsidies, tax reductions, and other measures, enterprises can be encouraged to participate in the education process, such as setting up internship bases, donating equipment, and jointly developing courses. Second, strengthen teachers' practical background and industry experience, encourage teachers to work in enterprises, improve teachers' industry sensitivity and practical teaching ability, and introduce enterprise experts as part-time teachers to enrich teaching content and methods. Third, establish a stable industry-university-research cooperation mechanism, such as industrial technology research institutes and innovation alliances, strengthen industry-university-research cooperation projects, encourage the transfer of research results from universities and scientific research institutions to enterprises, and accelerate the industrialization of scientific and technological achievements. Fourth, relevant laws and regulations should be improved, supervision mechanisms established and enhanced, legal guarantees for the industry-education integration provided, and the implementation effect of the industry-education integration projects should be ensured.

2. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should higher vocational colleges adopt to improve industry-education integration?

Given the current situation, I think higher vocational colleges can adopt the following strategies to improve industry-education integration: First, higher vocational colleges should increase capital investment for internship and training construction and the introduction of industry-education integration talents, and improve the hardware and software construction necessary for industry-education integration. Second, higher vocational colleges should deepen school-enterprise cooperation with enterprises, jointly formulate talent training plans, curriculum settings, teaching designs, internships, etc., and form an industry-education integration talent training community. Third, higher vocational colleges should be market-oriented, combined with national strategic needs, build an open regional industry-education integration practice center that integrates practical teaching, social training, actual production, and technical service functions, improve the professional settings of vocational

education, carry out first-class core courses and high-quality teaching materials, serve local enterprises in technology upgrading and product development, and improve teaching quality and level. Fourth, a unique school-enterprise cooperation coordination organization should be established to coordinate cooperation matters and strengthen communication and connection with enterprises.

3. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should enterprises adopt to improve industry-education integration?

Given the current situation, I suggest that enterprises adopt the following strategies to enhance the industry-education integration: First, enterprises should clarify their specific needs for talents, including skill requirements, professional qualities, etc., and actively participate in the professional planning and construction of higher vocational colleges to ensure that the educational content is closely connected with the needs of enterprises. Second, enterprises can open their own production, R&D, management, and other departments to provide students with internship opportunities so that they can learn and exercise in actual work. Third, cooperate with higher vocational colleges to establish on-campus and off-campus training bases, provide advanced equipment and technical support, and help students improve their operational skills in a real working environment. Fourth, enterprise experts participate in developing and designing courses, introducing the latest industry knowledge, technical standards, and work processes into the courses, and improving the practicality and foresight of the courses. Fifth, enterprise engineers and technical experts should be encouraged to serve as part-time teachers or lecture professors, and school teachers should be supported in practicing in enterprises to enhance mutual understanding and interaction. Sixth, cooperate with higher vocational colleges to conduct technical research and development projects, provide students with opportunities to participate in actual project development and cultivate their R&D capabilities and innovative spirit.

4. Given the current situation of students in higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should

students in higher vocational colleges adopt to improve industry-education integration?

Given the current situation, I think students in higher vocational colleges can adopt the following strategies to improve industry-education integration: First, actively learn and master professional knowledge and skills related to the industry, including participating in training and examinations for professional qualification certificates, obtaining qualification certification corresponding to the major, and ability to solve practical problems through participation in practical activities inside and outside the school. Second, take advantage of opportunities for cooperation between schools and enterprises, such as training bases, enterprise workshops, and innovation experimental areas, actively participate in practical projects, and transform theoretical knowledge into practical skills through practical operations while understanding corporate culture and work processes. Third, take the initiative to establish connections with industry enterprises, for example, conduct enterprise visits, internships, and employment guidance activities under the guidance of teachers, expand industry horizons, understand the needs of enterprises for talents, and thus improve their competitiveness in a targeted manner. Fourth, actively participate in innovation competitions, technology development projects, and entrepreneurial activities inside and outside the campus, exercise innovative thinking and problem-solving skills through practical operations, and accumulate experience in project management and teamwork. Fifth, besides studying professional courses, we must strengthen interdisciplinary learning and improve communication skills.

Interviewee 7

1. Given the current situation of students in higher vocational colleges in Guangdong Province regarding the industry-education integration, what strategies should students in higher vocational colleges adopt to enhance the industry-education integration?

Given the current situation, I think that students in higher vocational colleges can adopt the following strategies for industry-education integration: strengthen the learning method that combines theory with practice, actively participate in the

project practice of cooperation between schools and enterprises, deepen the understanding and application of theoretical knowledge through practical operations, and improve professional skills. Actively participate in the modern apprenticeship system and industrial college education model, connect with the actual needs of enterprises, and enhance professional counterparts' employment rate and competitiveness. Strengthen interaction and contact with enterprises, establish contact with enterprises in the industry through the school-enterprise cooperation platform, understand industry dynamics and enterprise needs; experience the enterprise environment and work process in person through visiting enterprises, internships, etc., and enhance the understanding of the enterprise operation mode. Participate in professional training provided by enterprises and obtain industry certification related to the profession, such as Huawei ICT engineer professional certification, to enhance the attractiveness of personal resumes. Develop an honest and rigorous professional attitude in practical training and enterprise practice, and improve personal ethics and professional spirit.

2. Given the current situation of higher vocational colleges in Guangdong Province regarding the industry-education integration, what strategies should higher vocational colleges adopt to improve the industry-education integration?

Given the current situation, I think higher vocational colleges can adopt the following strategies to enhance industry-education integration: establish long-term and stable school-enterprise cooperation with enterprises, encourage enterprises to participate in curriculum design, internships, and training, and talent training, and ensure that the educational content is closely integrated with industry needs. Optimize the practical teaching links, increase the proportion of internship and training courses, and ensure that students can gain sufficient practical experience during their school years. Invite enterprise experts to participate in teaching and conduct industry lectures, seminars, and other activities so that students can directly contact the cutting-edge knowledge and skills of the industry. Introduce enterprise talents with rich practical experience as part-time teachers to improve teachers' practical teaching ability and enhance the practicality of teaching. Support students in enterprise projects, innovation, and entrepreneurship activities, and cultivate their

practical ability and awareness of innovation. Establish an evaluation mechanism for integrating industry and education, regularly collect feedback from students, enterprises, and teachers, and promptly adjust and optimize relevant measures.

3. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should enterprises adopt to enhance industry-education integration?

Given the current situation, enterprises should adopt the following strategies to enhance industry-education integration: sign long-term cooperation agreements with higher vocational colleges, establish strategic partnerships, and jointly face the challenges and opportunities of the industry. According to enterprises' needs, cooperate with higher vocational colleges to implement order-based education, tailor-made talent training programs, and directly connect with the job needs of enterprises. Establish a stable communication and coordination mechanism with higher vocational colleges to ensure the timely update and exchange of education content and enterprise demand information, as well as timely adjustment of the direction of talent training. Support innovation and entrepreneurship education in higher vocational colleges, provide guidance, funds, and technical support for students with entrepreneurial intentions, and create a good innovation and entrepreneurship environment.

4. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should the government adopt to improve industry-education integration?

Given the current situation, I suggest the government adopt the following strategies to improve industry-education integration: introduce more specific policy measures and update and improve existing laws and regulations. Strengthen financial support and incentive mechanisms and provide financial subsidies and support to enterprises and colleges participating in industry-education integration. Establish an industry-education integration service platform to promote the connection between higher vocational colleges and enterprises and provide convenient information exchange and service support for school-enterprise cooperation. Optimize talent training programs and support higher vocational

colleges and enterprises in jointly developing courses and compiling textbooks. Promote exchanges and collaboration between teachers and enterprise experts and support teachers in participating in industry training and enterprise practice. Strengthen publicity efforts, encourage all sectors of society to join in the industry-education integration, and improve the awareness of all sectors of society on the importance of the industry-education integration.

Interviewee 8

1. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should the government adopt to improve industry-education integration?

Given the current situation, I suggest that the government adopt the following strategies to improve industry-education integration: First, establish a unique industry-education integration coordination mechanism, introduce a pilot plan, and clarify the development objectives, reform tasks, policy lists and key project lists of industry-education integration. Second, increase fiscal investment, provide sufficient financial support for vocational education, strive for national and provincial funds, and use local government special bonds to invest in vocational colleges and training bases. Third, it encourages enterprises to participate deeply in education and teaching reforms, professional planning, textbook development, curriculum setting, internships, and training of higher vocational colleges. It also gives enterprises tax incentives and vocational training subsidies per regulations. Fourth, build a school-enterprise cooperation platform, promote the joint construction of majors, courses, and training bases between schools and enterprises, implement the "1+X" certificate and modern apprenticeship systems, and carry out multi-level cooperative education. Fifth, the teaching staff should be strengthened, a teacher training system should be built, teachers' practical ability should be improved, and the quality of education and teaching should be ensured.

2. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should higher vocational colleges adopt to improve industry-education integration?

Given the current situation, I think higher vocational colleges can adopt the following strategies to improve industry-education integration: First, schools should establish a deeper cooperative relationship with enterprises, not only limited to providing internship positions but also including jointly formulating talent training plans jointly building training bases, and jointly developing courses. Second, a unique industry-education integration coordination agency should be set up to coordinate school-enterprise cooperation matters, ensure that educational content is updated synchronously with enterprise needs, and promote resource sharing and information exchange. Third, according to industrial development needs, regularly revise and adjust professional course settings, increase the proportion of practical teaching, introduce enterprise cases and engineering projects, and improve students' ability to solve practical problems. Fourth, experts with industry backgrounds should be introduced to participate in teaching or lectures, and teachers should be encouraged to practice in enterprises and participate in enterprise projects to enhance their industry practice experience and teaching level. Fifth, invest in constructing or upgrading internship and training bases inside and outside the school to simulate real working environments and provide students with more abundant and professional practical opportunities. Sixth, cooperate with enterprises to build majors and carry out in-depth cooperation in significant planning, curriculum design, teacher allocation, textbook writing, etc., to achieve a seamless connection between professional education and enterprise needs.

3. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should enterprises adopt to improve industry-education integration?

Given the current situation, I suggest that enterprises adopt the following strategies to improve industry-education integration: First, enterprises can establish close cooperative relations with higher vocational colleges, jointly formulate teaching syllabi and teaching content, meet the actual needs of students, and create a platform for teachers to communicate with enterprise technicians. Second, enterprises can invest in or cooperate with higher vocational colleges to build training bases and provide students with opportunities for practical operations and

internships by providing training equipment and venues. Third, enterprises can support higher vocational colleges in setting up mobile positions, hiring part-time teachers, determining part-time remuneration, and promoting the institutionalization of regular practice and training of professional teachers in colleges and universities. Fourth, enterprises can cooperate with higher vocational colleges to build secondary and industrial colleges and participate in professional settings, curriculum development, training, and internships. Fifth, enterprises can cooperate with higher vocational colleges to set up professional talent training bases in industrial parks according to industrial characteristics and enterprise needs and jointly formulate talent training plans. Sixth, enterprises can work with higher vocational colleges to tackle scientific research projects, from research and development results, and help enterprises produce and develop.

4. Given the current situation of students in higher vocational colleges in Guangdong Province regarding the industry-education integration, what strategies should students in higher vocational colleges adopt to improve the industry-education integration?

Given the current situation, I think that students in higher vocational colleges can adopt the following strategies for industry-education integration: First, college students should take the initiative to participate in practical activities, actively participate in various internships, training, social surveys, and other valuable activities organized by the school, deepen their understanding of the major they have learned through practice, and improve their practical skills. Second, college students should take the initiative to establish contact with enterprises, understand the needs of enterprises, participate in enterprise projects, learn in a real working environment, master professional skills, and accumulate work experience. Third, college students should improve their innovation and entrepreneurship capabilities, cultivate innovative awareness, dare to try new things, start small businesses, and exercise their abilities in practice. Fourth, college students should take the initiative to make reasonable suggestions to schools and enterprises in integrating industry and education activities and promote the further improvement of the school-enterprise cooperation mechanism.

Interviewee 9

1. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should the government adopt to improve industry-education integration?

Given the current situation, I suggest that the government adopt the following strategies to improve industry-education integration: First, the government implements tax incentives, which can effectively reduce the burden on enterprises and encourage enterprises to participate in industry-education integration; increase capital investment to support the construction of vocational colleges and training bases. Secondly, strengthen the construction of the teaching staff, support enterprise technical and management talents to teach in higher vocational colleges, establish a unique post plan for industrial teachers (mentors), allow higher vocational college teachers and enterprise professional and technical personnel to work part-time, and optimize the teacher structure of higher vocational colleges. Finally, an industry association for industry-education integration should be established as a communication bridge between government departments, colleges, and enterprises to promote the development of industry-education integration enterprises.

2. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should higher vocational colleges adopt to improve industry-education integration?

Given the current situation, higher vocational colleges can adopt the following strategies to improve industry-education integration: First, higher vocational colleges should increase capital investment and improve the construction of internship and training bases. Second, higher vocational colleges should strengthen the construction of the teaching staff, encourage teachers to practice in enterprises, and hire enterprise technicians as part-time teachers to enhance the practicality of teaching and improve teaching quality. Finally, higher vocational colleges should also deepen industry-education cooperation with enterprises, sign cooperation agreements, and invite enterprises to participate in curriculum design, teaching process, and

compilation of teaching materials to ensure that the course content matches the needs of the industry.

3. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should enterprises adopt to improve industry-education integration?

Given the current situation, I suggest that enterprises adopt the following strategies to improve industry-education integration: First, enterprises should strengthen school-enterprise cooperation, actively participate in the curriculum development and talent training program formulation of higher vocational colleges, and provide internship positions, training bases, and simulated working environments for students of higher vocational colleges, so that students can learn and practice in real business scenarios, thereby improving their professional skills and work suitability. Secondly, enterprises should provide resources and financial support, invest funds to support higher vocational colleges in building teaching facilities such as training bases, laboratories, studios, and innovation centers, provide students with advanced learning and research environments, set up scholarships to encourage innovation and practical activities of students in higher vocational colleges, stimulate students' learning interest and innovation potential, and attract outstanding students to join enterprises. Finally, enterprises should participate in course teaching and joint R&D projects, send technical experts and management backbones with rich practical experience to higher vocational colleges as part-time teachers or lecturers, directly impart practical work knowledge and experience to students, apply for scientific research projects with higher vocational colleges, cooperate in technology development and research, provide students with opportunities to participate in real projects and cultivate their scientific research capabilities and innovative thinking.

4. Given the current situation of students in higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should students in higher vocational colleges adopt to improve industry-education integration?

Given the current situation, I think students in higher vocational colleges can adopt the following strategies to improve industry-education integration: First, college students should learn the knowledge of their majors and master professional skills. Second, college students should actively participate in internships and training activities, go to enterprises to understand the actual working environment and job requirements, and learn and improve their professional skills in a targeted manner. Finally, college students should also actively participate in lectures, seminars, forums, etc., related to industry-education integration inside and outside the school to understand the latest research results and practical experience and broaden their horizons.

Interviewee 10

1. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should the government adopt to improve industry-education integration?

Given the current situation, I suggest the government adopt the following strategies to improve industry-education integration: The government should optimize the policy environment, improve relevant laws and regulations, and encourage enterprises and higher vocational colleges to integrate industry-education. The government should increase financial investment, set up special funds to support industry-education integration projects, and subsidize the construction of vocational college training bases, internship training bases, etc., led or participated by enterprises. The government should build a cooperation platform, establish a government-led industry-education integration coordination mechanism, integrate resources from all parties, and provide docking services, such as holding regular industry-education integration work meetings to exchange experiences and practices. Strengthen teacher training and support the construction of a dual-qualified teaching team. Professional and technical personnel can be organized to teach in schools, and teachers can also be supported to practice in enterprises.

2. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should higher vocational colleges adopt to improve industry-education integration?

Given the current situation, I think higher vocational colleges can adopt the following strategies to enhance industry-education integration: Higher vocational colleges can actively seek government policy support and financial investment, increase publicity efforts, improve the public's awareness of the importance of industry-education integration, attract more enterprises to participate, and promote the implementation of industry-education integration. Higher vocational colleges can also establish close cooperative relations with enterprises to jointly formulate teaching syllabi and teaching content to meet the actual needs of students and, at the same time, create a platform for teachers to communicate with enterprise technicians. Higher vocational colleges should strengthen the construction of practical training bases, improve the infrastructure of practical training bases, improve the pertinence and practicality of practical training teaching, and provide students with a superior internship environment. Higher vocational colleges should adjust their professional settings according to industrial needs, prioritize the development of majors needed by emerging industries, accelerate the construction of majors with talent shortages, transform and upgrade traditional majors, and withdraw and eliminate majors with oversupply. Higher vocational colleges should also strengthen the training of teachers and improve their teaching ability and convenient application ability to serve the industry-education integration better.

3. Given the current situation of higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should enterprises adopt to enhance industry-education integration?

Given the current situation, I suggest that enterprises adopt the following strategies for industry-education integration: Enterprises should jointly invest in the construction of training bases or R&D centers with higher vocational colleges or share resources with higher vocational colleges, such as laboratory equipment, software platforms, etc., to provide students and enterprises with better hardware

support. Enterprises should actively participate in curriculum development to ensure the teaching content can better reflect the industry's latest trends and technical needs. Enterprises should provide internship and training opportunities for students of higher vocational colleges so that students can learn and grow in a real working environment. Enterprises should also encourage their technical personnel to enter campus as part-time teachers and support school teachers working in enterprises. Enterprises should also regularly hold seminars, lectures, technical sharing sessions, and other activities to promote knowledge sharing and technical exchanges between schools and enterprises.

4. Given the current situation of students in higher vocational colleges in Guangdong Province regarding industry-education integration, what strategies should students in higher vocational colleges adopt to improve industry-education integration?

Given the current situation, I think students in higher vocational colleges can adopt the following strategies to improve industry-education integration: College students can take the initiative to participate in school-enterprise cooperation projects carried out by the school, get opportunities for enterprise practice training, and increase industry experience. College students can also use their spare time and summer vacation to participate in social practice and on-the-job internships, participate in social practice activities and on-the-job internship activities organized by the school, experience the corporate environment, and enhance their understanding of the company. College students should also focus on practical training skills, strive to master the practical operation skills of their majors, participate in various skill competitions and club activities, and cultivate hands-on ability. College students should also pay attention to and learn new knowledge, pay close attention to industry development trends and new knowledge, take the initiative to learn and master, improve their comprehensive quality, and enhance their employment competitiveness.

Appendix E
Certificate of English



BANSOMDEJCHAOPRAYA
RAJABHAT UNIVERSITY

This is to certify that

Mr. Wen Yuli

Achieved BSRU English Proficiency Test (BSRU-TEP) level

C2

Given on 9th August 2022

A handwritten signature in blue ink, appearing to read 'K. A.', is written over a faint circular stamp.

(Assistant Professor Dr. Kulsirin Aphiratvoradej)

Director

Appendix F

The Document for Acceptance Research

**The Editorial Board of Higher Education Studies
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January 15, 2025

Dear Wen Yuli,

Thanks for your submission to *Higher Education Studies*.

We have the pleasure to inform you that your manuscript has been accepted for publication. It will be published in the issue of Vol. 15, No. 1, in March 2025.

Title: Strategies for the Sustainable Development of Industry-Education Integration in Higher Vocational Colleges in Guangdong Province

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Sincerely,

Sherry Lin



On behalf of,
The Editorial Board of *Higher Education Studies*
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Strategies for the Sustainable Development of Industry-Education Integration in Higher Vocational Colleges in Guangdong Province

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Received: December 11, 2024

Accepted: January 18, 2025

Online Published: January 23, 2025

doi:10.5539/hes.v15n1p245

URL: <https://doi.org/10.5539/hes.v15n1p245>

Abstract

In order to find strategies for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province, this paper takes 384 students and 361 teachers from 5 higher vocational colleges in Guangdong Province, seven senior education managers from 5 higher vocational colleges, and three senior business managers from 3 enterprises as the research subjects. This study designed a questionnaire for students and teachers to analyze the factors affecting the development status of industry-education integration at four levels: the government, higher vocational college, enterprise, and student levels. The results show that although students and teachers of higher vocational colleges in Guangdong Province believe that the overall development status of industry-education integration is at a high level in all four aspects, there are still deficiencies in government policy support, higher vocational colleges in teacher talent construction, enterprises in capital investment, and students in practical ability. In order to bridge these gaps, this study used SWOT-PEST analysis and TOWS analysis and proposed a set of targeted strategy drafts, which cover four aspects and a total of 37 measures. Finally, 25 senior education managers conducted focus group discussions on the draft strategies. Eventually, they formed a strategy covering four aspects and a total of 19 measures, including five measures at the government level, five for higher vocational colleges, five for enterprises, and four measures for students. In order to verify the feasibility and adaptability of the strategy, 25 experts from 5 higher vocational colleges were invited to evaluate the strategy. The strategy evaluation experts believed that the overall feasibility and adaptability of the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province were at the highest level ($\bar{x}=4.51$) and ($\bar{x}=4.68$), respectively. These strategies provide feasible methods for the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. These can help higher vocational colleges improve the quality of talent training, enhance students' employment competitiveness and adaptability, and promote industrial development and social progress.

Keywords: industry-education integration, sustainable development of vocational education, higher vocational colleges, strategy

1. Introduction

Against the backdrop of rapid changes in the global economy, driven by technological innovation and industrial transformation, vocational education plays a vital role in connecting education and economic development. Industry-education integration is an important model of vocational education and a key strategy for vocational education. It emphasizes the deep coordination between the education system and the industrial sector. Its core goal is to shorten the time gap between skill training and market demand through cooperation between schools and enterprises while enhancing the ability of education to serve economic resilience and sustainable development (Busemeyer & Trampusch, 2012).

Countries worldwide have been committed to exploring industry-education integration models that align with local conditions. Germany's dual vocational education system is a classic example of industry-education integration. The German Vocational Education Act supports this model and is widely used by enterprises. This model ensures the market adaptability of students' skills, and enterprises can also benefit from it. Therefore, this

system is favored for its significant economic benefits (BIBB, 2021). Australia has established a National Skills Framework to clarify vocational education's goals and industry standards. Educational institutions jointly design training programs with enterprises according to the framework's requirements. The industry-led training model improves the market adaptability of vocational education and promotes the continuous updating of educational content (Wheelahan, Buchanan, & Yu, 2015). This model helps promote lifelong learning and workforce adaptability, which is significant for economic sustainable development. Community colleges in the United States provide students with customized vocational education paths through flexible curriculum design and cooperation with local enterprises. This cooperation model utilizes federal funds and tax incentives to promote innovation and ensure talent supply for regional industries (Perkins Act, 2018). Japan's industry-education integration focuses on "collaborative training between schools and enterprises" and "lifelong vocational education," emphasizing the tripartite cooperation between government, enterprises, and schools. Japan's vocational education system has achieved the combination of theory and practice through the work-study system (similar to the German dual system) and industry-university-research cooperation (Amano, 2018).

China's industry-education integration model has developed rapidly in recent years, and policy-driven is its most prominent feature. The Chinese government has issued policies such as the National Vocational Education Reform Implementation Plan and the Pilot Implementation Plan for Industry-Education Integration, emphasizing the integrated coordination of "government, industry, academia, research and application" to promote the reform of the vocational education system. China's industry-education integration is mainly achieved through the industrial college model, modern apprenticeship system, and regional pilot projects. Huawei and Guangdong Vocational College jointly built the ICT College. CRRC Group and Changsha Vocational and Technical College cooperated in the modern apprenticeship project, which has become a national example of industry-education integration (Ministry of Education, 2020). However, China also faces challenges such as insufficient corporate participation, insufficient depth of cooperation, and unbalanced regional development. By introducing incentive policies and optimizing resource allocation, China has continued to work hard on the depth and sustainable development of industry-education integration (Busemeyer & Trampusch, 2012).

In conclusion, promoting higher vocational education requires the full implementation of industry-education integration to enhance students' employment competitiveness and adaptability and promote industrial development and social progress. By establishing a close school-enterprise cooperation relationship and forming a deep integration of industry and education, higher vocational colleges can better meet the industry's talent needs and provide education and training programs closely connected with market demand. The implementation of industry-education integration can closely integrate teaching content with actual work and enhance students' practical and innovative abilities. In addition, the government, higher vocational colleges, and enterprises must work together to establish a long-term and stable cooperation mechanism to promote the in-depth development of industry-education integration.

2. Method

2.1 Definition

Industry-education integration mainly refers to the cooperation between industry (industry, enterprise) and education (mainly higher vocational schools) in jointly building majors, building teaching staff, building productive internship training bases, and cultivating talents.

SWOT-PEST analysis is a comprehensive research tool, and this study adopts it as a strategic tool. SWOT analysis identifies internal strengths and weaknesses, while PEST analysis examines external political, economic, social, and technological factors. Integrating these frameworks enables a systematic assessment of opportunities and threats that affect the sustainable development of industry-education integration.

As part of China's higher education system, higher vocational colleges are designed to cultivate technical and skilled personnel and students with good professional qualities. The higher vocational college students referred to in this article are full-time students studying in higher vocational colleges.

2.2 Theoretical Framework

Based on the research on theoretical models of industry-education integration, the main popular theoretical models in various countries worldwide are the tripartite collaborative governance, dual-subject, and regional ecological models. The primary theoretical basis of this study is the use of the tripartite collaborative governance model. This comprehensive framework aims to achieve efficient and sustainable development of industry-education integration through the collaborative cooperation of the government, schools, and enterprises. This model establishes a stable cooperation mechanism by clarifying the roles and responsibilities of the three

parties in industry-education integration and promotes the deep integration of education and industry. (Zhang, X., & Wang, 2020) Vocational college students are one of the core subjects in industry-education integration. They are the direct beneficiaries of education and important carriers of industry needs. Students play an important role in the industry-education integration system. As the primary training objects of skilled talents, the learning and practice of vocational college students directly serve the needs of the industry, so this study will fully consider the factors affecting students on industry-education integration. Formulate the following theoretical framework diagram.

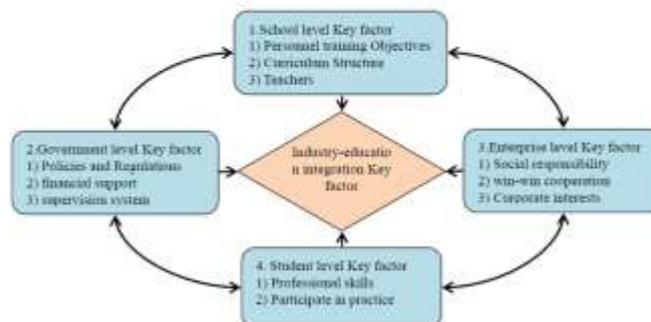


Figure 1. Theoretical framework

2.3 Research Design

2.3.1 Questionnaire and Interview Design

In order to understand the current situation of industry-education integration in higher vocational colleges in Guangdong Province and propose strategies that are conducive to the development of industry-education integration in higher vocational colleges in Guangdong Province, a questionnaire on the current situation of industry-education integration was designed for students and teachers in higher vocational colleges in Guangdong Province. This questionnaire has a total of 26 questions, mainly involving six questions on students' performance in the development of industry-education integration, eight questions on the performance of higher vocational colleges in the development of industry-education integration, six questions on the performance of enterprises in the development of industry-education integration, and six questions on the performance of the government in the development of industry-education integration. In order to find strategies for developing industry-education integration in higher vocational colleges in Guangdong Province, an interview form was designed for higher vocational college education managers and senior corporate managers. This interview form is designed with four questions: 1) Given the current situation of students in Guangdong Province's higher vocational colleges regarding industry-education integration, what strategies should students adopt to improve industry-education integration? 2) Given the current situation of Guangdong Province's higher vocational colleges regarding industry-education integration, what strategies should schools adopt to improve industry-education integration? 3) Given the current situation of Guangdong Province's higher vocational colleges regarding industry-education integration, what strategies should enterprises adopt to improve industry-education integration? 4) Given the current situation of Guangdong Province's higher vocational colleges regarding industry-education integration, what strategies should the government adopt to improve industry-education integration?

2.3.2 Research Tool Verification

In order to control and optimize the quality of the questionnaire survey or interview process, the researcher checked the questionnaire's objective consistency index (IOC) (Brian Foote, 1988), an observation tool used to evaluate and improve the questionnaire survey or interview process. It systematically evaluates the interaction between the observer and the observed (such as the interviewee or the investigator) during the survey/interview process. This study invited three Associate Professors, Dr. from Bansomdejchaopraya Rajabhat University in Thailand and two Professors from Heyuan Vocational and Technical College in China, as expert examiners. Each expert scored the questionnaire items: +1 means highly relevant to the research objective, 0 means moderate or uncertain relevance, and -1 means irrelevant to the research objective. The calculation formula is:

$$IOC = \frac{\text{Number of experts giving a score of } +1 - \text{Number of experts giving a score of } -1}{\text{Total number of experts}}$$

The IOC values of this research tool are all between 0.6 and 1. The IOC result values of the questionnaire items are 0.6 and 1, which shows that these items are reasonably designed, highly relevant to the research objectives, and can be used for formal surveys.

2.3.3 Validity and Reliability Test of the Questionnaire

To ensure the validity and credibility of the questionnaire, the researchers distributed the questionnaire to 20 students from higher vocational colleges for trial use. SPSS software was used to conduct validity and reliability analyses on the trial data. According to the reliability analysis results, the reliability coefficient value is 0.955, which is greater than 0.9, which shows that the reliability quality of the research data is very high. The CITC values of the analysis items are generally between 6.0 and 8.0, and the CITC values are all greater than 0.4, indicating a good correlation between the analysis items. It also shows that the reliability level is good and can be used for further analysis. According to the results of the validity analysis, the KMO and Bartlett tests were used for validity verification. The KMO value is 0.933, and the KMO value is more significant than 0.8. The research data is very suitable for extracting information (which reflects the good validity from the side).

2.3.4 Questionnaire and Interview Form Distribution

In order to ensure the rationality of the questionnaire survey, the researchers selected four public higher vocational colleges in different regions of Guangdong Province in the east, south, west, and north, as well as the best private higher vocational college in Guangdong Province. Then, according to the Table of Krejcie and Morgan for Finite Population, 384 students and 361 teachers from the five higher vocational colleges were selected as the survey subjects. Each scale was obtained from a reliable standard instrument determined in previous studies. A five-point Likert scale was used from 1 (lowest level) to 5 (highest level). A five-point Likert scale was used from 1 (lowest importance) to 5 (highest importance). At the same time, seven senior education managers from five higher vocational colleges and three senior corporate managers from three companies were contacted to participate in online one-on-one interviews. Education managers must meet the following conditions: 1) have worked in the school for more than 5 years; 2) be responsible for specific work such as school-enterprise cooperation and integration of industry and education; 3) be willing to participate in structured interview recordings; 4) be willing to review interview records for verification. Senior managers of enterprises must meet the following conditions: 1) There is school-enterprise cooperation between the enterprise and the higher vocational college; 2) Senior managers of enterprises who participate in the formulation of enterprise development policies; 3) Willing to participate in structured interview recordings; 4) Willing to review interview records for verification.

2.4 Questionnaire Survey and Interviews

A total of 1,000 questionnaires were distributed in this study, including 500 for students of higher vocational colleges and 500 for teachers of higher vocational colleges. Eight hundred forty-two responses were collected, with a response rate of 84.20%, including 454 responses from students, a response rate of 90.80%, 384 valid questionnaires, and an effective rate of 84.58%; 388 responses from teachers, a response rate of 77.60%, and 361 valid questionnaires, with an effective rate of 93.04%.

Table 1. Number and percentage of respondents

Personal information		Students n=384, teachers n=361			
		Students		Teachers	
		Number	Percent(%)	Number	Percent(%)
School	Shenzhen Polytechnic	119	30.99	125	34.63
	Guangdong Polytechnic of Light Industry	92	23.96	95	26.32
	Heyuan Polytechnic	63	16.41	43	11.91
	Shanwei Polytechnic	35	9.11	33	9.14
	Guangzhou Huali Polytechnic	75	19.53	65	18.01
Total		384	100.0	361	100.0
Gender	Male	166	43.23	121	33.52
	Female	218	56.77	240	66.48
Total		384	100.0	361	100.0

According to Table 1, the distribution of respondents shows that 119 students from Shenzhen Polytechnic University accounted for 30.99%, 125 teachers accounted for 34.63%, 92 students from Guangdong Polytechnic University accounted for 23.96%, and 95 teachers accounted for 26.32%; 63 students from Heyuan Polytechnic College accounted for 16.41%, and 43 teachers accounted for 11.91%; 35 students from Shanwei Polytechnic College accounted for 9.11%, and 33 teachers accounted for 9.14%; 75 students from Guangzhou Huali Polytechnic College accounted for 19.53%, and 65 teachers accounted for 18.01%; among them, 166 male students accounted for 43.23%, and 121 male teachers accounted for 33.52%, 218 female students accounted for 56.77%, and 240 female teachers accounted for 66.48%.

The researchers used content analysis to analyze and organize the data of 10 interviewees, extract and summarize adequate information, and combined with previous research foundations, proposed a draft strategy and related measures to promote the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. These measures mainly focus on 1) the government strengthening policy formulation and guidance, increasing financial investment and support, and establishing an industry-education integration platform; 2) higher vocational colleges optimizing the curriculum system and talent training model, strengthening the construction of the faculty team, and strengthen the construction of the industry-education integration platform; 3) enterprises participate in professional construction, curriculum development, and talent training programs, jointly build internship and training bases inside and outside the school, and provide resources, equipment, technology and financial support; 4) students actively participate in internships and training activities, and actively participate in extracurricular practice, industry-education integration, innovation and entrepreneurship projects.

3. Results

3.1 Data Analysis

The researchers analyzed the questionnaire survey data through the software package (SPSS) program, used descriptive statistical methods to process the questionnaire statistical data, and analyzed the current status of industry-education integration development in higher vocational colleges in Guangdong Province through the mean and standard deviation.

Table 2. Mean and standard deviation of the current status of industry-education integration in four aspects of higher vocational colleges in Guangdong Province

Current status of industry-education integration	Students n=384, Teachers n=361				Teachers			
	\bar{x}	S.D.	Level	Order	\bar{x}	S.D.	Level	Order
1. Students' performance in industry-education integration	3.86	0.82	high	1	4.21	0.55	high	1
2. Schools' performance in industry-education integration	3.76	0.82	high	2	4.10	0.62	high	2
3. Enterprises' performance in industry-education integration	3.63	0.81	high	4	3.95	0.59	high	3
4. Governments' performance in industry-education integration	3.68	0.83	high	3	3.73	0.70	high	4
Total	3.73	0.82	high		4.00	0.61	high	

According to Table 2, it is found that students and teachers of higher vocational colleges in Guangdong Province believe that the current status of the four aspects of the integration of industry and education is at a high level ($\bar{x}=3.72$) and ($\bar{x}=4.0$). Students and teachers all agree that the highest level is the performance of students in the integration of industry and education ($\bar{x}=3.86$) and ($\bar{x}=4.21$), followed by the performance of schools in the integration of industry and education ($\bar{x}=3.76$) and ($\bar{x}=4.10$), among which the performance of the government in the integration of industry and education ($\bar{x}=3.68$) and ($\bar{x}=3.73$), and the performance of enterprises in the integration of industry and education ($\bar{x}=3.63$) and ($\bar{x}=3.95$). The results show that the performance of students and teachers in integrating industry and education in higher vocational colleges in Guangdong Province is consistent.

3.2 SWOT-PEST Analysis and TOWS Analysis to Draw Up a Draft Strategy

The researchers classified, summarized, and sorted out the suggestions of 10 interviewees on the four questions. They agreed on many suggestions, but there were also differences in some suggestions. Therefore, it is necessary

to use PEST analysis on these suggestions further, analyze the macro-environmental factors affecting the development of industry-education integration in higher vocational colleges in Guangdong Province, and find out the four major external factors that are closely related to the development of industry-education integration in higher vocational colleges in Guangdong Province, namely politics, economy, society, and technology. Then, SWOT analysis is used to analyze the internal and external competitive environment and situation under competitive conditions that affect the development of industry-education integration in higher vocational colleges in Guangdong Province and find out the various significant internal advantages, disadvantages, and external opportunities and threats that are closely related to the development of industry-education integration in higher vocational colleges in Guangdong Province, and draw a series of corresponding conclusions from them, to prepare for the formulation of corresponding development strategies based on the research results. In order to bridge these gaps, this study combines PEST analysis and SWOT analysis to form a SWOT-PEST influencing factor analysis matrix. As shown in Figure 3.

Table 3. SWOT-PEST analysis table of the integration of industry and education in Guangdong vocational colleges

		PEST Factor
SWOT Factor	Strengths (S)	<p>Strengths (S)-Politics (P)</p> <p>SP1 The government attaches great importance to it and formulates a series of policies and regulations</p> <p>SP2 The government implements supervision and evaluation</p> <p>SP3 The government and higher vocational colleges both support the establishment of an industry-education integration platform</p> <p>Strengths (S)-Economy (E)</p> <p>SE1 The government provides financial support and provides funds and tax incentives</p> <p>SE2 Higher vocational colleges are willing to increase their capital investment</p> <p>SE3 Enterprises is willing to provide resources, equipment, technology, and financial support</p> <p>Strengths (S)-Society (S)</p> <p>SS1 The government and higher vocational colleges are willing to strengthen the construction of the teaching staff</p> <p>SS2 Enterprises are willing to provide sufficient human resources</p> <p>SS3 Students actively participate in internships and training, and industry-education integration activities</p> <p>SS4 Established a coordination organization for industry-education integration and school-enterprise cooperation</p> <p>Strengths (S)-Technology (T)</p> <p>ST1 Higher vocational colleges optimize the curriculum system and talent training model</p> <p>ST2 Higher vocational colleges and enterprises are willing to jointly build internship and training bases inside and outside the school</p>
	Weaknesses (W)	<p>Weaknesses (W)-Politics (P)</p> <p>WP1 Uneven regional economic development leads to the uneven development of industry-education integration</p> <p>WP2 The policies and regulations issued by the government are not perfect</p> <p>WP3 The government does not pay enough attention to the development of industry-education integration in higher vocational colleges</p> <p>Weaknesses (W)-Economy (E)</p> <p>WE1 Uneven economic development leads to uneven investment in industry-education integration</p> <p>WE2 The current global economic environment is in a downturn, and the government, higher vocational colleges, and enterprises face insufficient funds.</p> <p>Weaknesses (W)-Society (S)</p> <p>WS1 The communication mechanism between higher vocational colleges and enterprises is not smooth enough</p> <p>WS2 The government, higher vocational colleges, and enterprises have not</p>

	PEST Factor
	established an industry-education integration feedback mechanism
	WS3 Higher vocational college students have weak independent learning ability, humanistic qualities, teamwork ability, and innovation and entrepreneurship ability
	Weaknesses (W)-Technology (T)
	WT1 The government has not formulated a general plan and implementation plan for industry-education integration
	WT2 The depth of enterprises and higher vocational colleges' participation in industry-education integration activities is insufficient
	WT3 Higher vocational colleges are out of touch with enterprise needs, and the curriculum setting is lagging behind
Opportunities (O)	Opportunities (O)-Politics (P)
	OP1 The country is accelerating the layout of strategic emerging industries and vigorously supporting the integration of industry and education in vocational education
	OP2 The national education department promotes the improvement of the quality and efficiency of vocational education and builds high-level vocational schools and majors
	Opportunities (O)-Economy (E)
	OE1 Economic transformation and upgrading promotes integrating industry and education in vocational education
	OE2 The development of emerging industries provides opportunities for the integration of industry and education
	Opportunities (O)-Society (S)
	OS1 The salary level of professional and technical talents continues to increase, attracting more students from higher vocational colleges to participate in the integration of industry and education activities
	OS2 The integration of industry and education between enterprises and higher vocational colleges can bring tangible benefits to enterprises
	Opportunities (O)-Technology (T)
	OT1 Economic transformation and upgrading intensify the demand of enterprises for technical and skilled talents and promote cooperation between enterprises and higher vocational colleges
	OT2 Global technological innovation puts forward new requirements for technical and skilled talents and promotes the integration of industry and education
Threats (T)	Threats (T)-Politics (P)
	TP1 Intensified geopolitical tensions and global economic instability pose challenges to the integration of industry and education in vocational education
	TP2 Changes in government policies affect the direction of integration of industry and education
	Threats (T)-Economy (E)
	TE1 Economic downturn may lead to reduced investment in education, affecting the enthusiasm of governments, enterprises, and higher vocational colleges for the integration of industry and education
	TE2 The rise of other regional economies has led to a brain drain, posing a challenge to the integration of industry and education in higher vocational colleges in Guangdong Province
	Threats (T)-Society (S)
	TS1 The decline in the birth rate and the lack of students in higher vocational colleges pose a threat to the integration of industry and education
	TS2 Social prejudices lead to low recognition of vocational education, affecting enthusiasm for the integration of industry and education
	Threats (T)-Technology (T)
	TT1 The mismatch between higher vocational education and the development of the digital economy may affect the integration of industry and education
	TT2 International technological barriers affect the cultivation of talents in higher

PEST Factor
vocational education and hinder the integration of industry and education
TT3 Rapid technological updates lead to a disconnect between the integration of industry and education courses and skills

Finally, a set of targeted strategy drafts was proposed through TOWS matrix analysis, as shown in Table 4. These strategy drafts cover four aspects: government, higher vocational colleges, enterprises, and students, with 37 measures. As shown in Figure 4. These strategy drafts are based on the questionnaire survey results, and the items with the lowest average scores in each variable are found. Interview results and relevant literature also support these suggestions.

Table 4. TOWS matrix analysis

	External Opportunities	External Threats
Internal Strengths	SO (Leverage Advantages to Seize Opportunities) Strategy: <ol style="list-style-type: none"> 1. The government strengthens policy formulation and guidance and implements supervision and evaluation mechanisms 2. The government and higher vocational colleges jointly establish an industry-education integration platform 3. The government and higher vocational colleges should jointly strengthen the construction of the teaching staff 4. The government provides financial support and tax incentives for higher vocational colleges and enterprises 5. Higher vocational colleges and enterprises cooperate to build on-campus and off-campus internship and training bases 6. Higher vocational colleges should increase their capital investment 7. Higher vocational colleges should continuously optimize the curriculum system and talent training model 8. Enterprises should strengthen resources, equipment, technology, and financial support 9. Enterprises should provide sufficient human resources 10. Students actively participate in extracurricular practice, industry-education integration, innovation and entrepreneurship, and other projects 11. The government should formulate an overall plan and implementation plan for the integration of industry and education 	ST (Strengths-Minimize-Threats) Strategy: <ol style="list-style-type: none"> 1. The government should strengthen the stability and continuity of policies and ensure policy stability 2. The government, higher vocational colleges, and enterprises should set up special funds for industry-education integration to ensure capital investment 3. The government should strengthen the publicity and promotion of vocational education and change the prejudice against vocational education 4. Enterprises should participate in professional construction, curriculum development, and talent training programs to ensure the consistency of industry-education integration courses and skills 5. Enterprises should regularly hold lectures, seminars, and corporate open days to allow more students from higher vocational colleges to participate in industry-education integration 6. Students should pay attention to market demand and industry trends 7. Students should actively obtain skills or professional qualification certificates
Internal Weaknesses	WO (Improve Weaknesses, Exploit Opportunities) Strategy: <ol style="list-style-type: none"> 1. The government should vigorously support the development of industry-education integration in vocational education and increase the attention paid to the development of industry-education integration in higher vocational colleges 2. The government should continuously improve policies and regulations 3. The government, higher vocational colleges, and enterprises should establish a feedback mechanism 	WT (Reducing Weaknesses and Threats) Strategy: <ol style="list-style-type: none"> 1. The government should promote vocational education reform, industrial resource upgrading, and integration 2. Vocational colleges should strengthen the construction of teaching staff (hiring enterprise mentors, teachers to practice in enterprises, teacher training, etc.) Vocational colleges should jointly apply for and develop projects with enterprises

for industry-education integration	3. Enterprises should continue to pay attention to policy trends and market demand changes
4. The government should formulate an overall plan and implementation plan for industry-education integration	4. Enterprises should provide students with sufficient internship and training opportunities
5. The government should encourage enterprises and higher vocational colleges to participate in industry-education integration activities deeply	5. Students should strengthen communication and exchanges with enterprises
6. Higher vocational colleges and enterprises should establish a smooth communication mechanism	6. Students should continuously improve their professional skills and practical ability
7. Higher vocational colleges and enterprises should establish long-term cooperative relations	7. Students should continuously strengthen their humanistic qualities, teamwork ability, and innovation and entrepreneurship ability
8. Students should strengthen their independent learning ability	
9. Vocational colleges should establish coordination agencies for industry-education integration and school-enterprise cooperation	

Twenty-five experts from different higher vocational colleges in Guangdong Province were invited to participate in the strategy evaluation on improving the sustainable development strategy of integrating industry and education in higher vocational colleges in Guangdong Province. The group comprises senior education experts, full-time teachers, and senior leaders. Among them, educational management personnel must meet the following conditions: 1) have worked in the school for more than 15 years; 2) be responsible for specific work such as school-enterprise cooperation, integration of industry and education, etc.; 3) have the title of associate professor or above; 4) must be willing to participate in the structured interview recording; 5) must be willing to review the interview records for verification.

The final strategies are shown in Table 5 after being evaluated by the draft strategy evaluation experts and receiving additional suggestions.

Table 5. Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province

Strategy	Specific measures
Government-level strategies	<ol style="list-style-type: none"> 1. Strengthen the formulation of industry-education integration policies, establish supervision, evaluation, and feedback mechanisms, and continuously improve them. 2. Increase financial support and tax incentives and establish special funds for industry-education integration. 3. Formulate an overall plan and implementation plan for integrating industry and education and establish an industry-education integration platform. 4. Strengthen the publicity and promotion of vocational education and encourage enterprises and higher vocational colleges to participate deeply in industry-education integration activities. 5. Strengthen the construction of a talent team integrating industry and education.
Strategies at the vocational college level	<ol style="list-style-type: none"> 1. Strengthen school-enterprise cooperation, maintain a smooth communication mechanism, jointly build on-campus and off-campus internship and training bases, and jointly apply for and develop projects. 2. Actively seek policy and financial support and increase investment in industry-education integration. 3. Strengthen the construction of the teaching staff (hiring enterprise mentors, teachers to practice in enterprises, teacher training, etc.). 4. Optimize the curriculum system and talent training model (professional setting, curriculum construction, internship training, teaching material development, etc.). 5. Establish a coordination organization for integrating industry, education, and school-enterprise cooperation.
Enterprise-level strategy	<ol style="list-style-type: none"> 1. Strengthen school-enterprise cooperation, jointly build on-campus and off-campus training bases, and actively participate in higher vocational colleges' professional construction, curriculum development, and personnel training. 2. Increase resources, equipment, technology, and financial support for integrating industry

	and education and establish special funds.
	3. Regularly hold industry-education integration lectures, seminars, company open days, and other activities to provide students with sufficient internship and training opportunities.
	4. Continue to pay attention to policy trends, technological innovations, and changes in market demand.
	5. Provide sufficient human resources to meet the needs of industry-education integration.
Student-level strategies	1. Participate in internships, practical training, extracurricular practice, innovation and entrepreneurship, and other activities.
	2. Actively communicate and exchange with enterprises and pay attention to market demand and industry trends.
	3. Continuously improve professional skills and practical abilities and actively obtain skills or professional qualification certificates.
	4. Continuously strengthen independent learning, humanistic qualities, teamwork, innovation, and entrepreneurship capabilities.

Experts evaluate the adaptability and feasibility of strategies.

Twenty-five experts from different higher vocational colleges in Guangdong Province were invited to participate in evaluating the adaptability and feasibility of the strategy to improve the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. The group comprises senior education experts, full-time teachers, and senior leaders. Among them, educational managers must meet the following conditions: 1) have worked in the school for more than 15 years; 2) be responsible for the specific work of school-enterprise cooperation, industry-education integration, etc.; 3) have the title of associate professor or above; 4) must be willing to participate in the structured interview recording; 5) must be willing to review the interview record for verification.

Four aspects and 19 items are part of the strategy to improve the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. All scales use the Likert 5 scale, with a maximum value of 5 and a minimum of 1. The data interpretation of the mean value is based on RensisLikert (1932): 4.50-5.00 represents the highest level, 3.50-4.49 represents a high level, 2.50-3.49 represents a medium level, 1.50-2.49 represents a low level, and 1.00-1.49 represents the lowest level.

Based on the expert evaluation results, this paper analyzes the mean and standard deviation of the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province from four aspects: 1) government-level strategy, 2) higher vocational college-level strategy, 3) enterprise-level strategy, and 4) student-level strategy. The evaluation results are as follows:

Table 6. Mean and standard deviation of the adaptability and feasibility of the implementation of the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province

Strategies to improve the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province	Feasibility			Adaptability		
	\bar{x}	S. D.	Level	\bar{x}	S. D.	Level
1. Strategies at the government level	4.50	0.51	highest	4.70	0.50	highest
2. Strategies at the higher vocational college level	4.68	0.52	highest	4.75	0.43	highest
3. Strategies at the enterprise level	4.31	0.57	high	4.68	0.47	highest
4. Strategies at the student level	4.56	0.52	highest	4.59	0.49	highest
Total	4.51	0.53	highest	4.68	0.47	highest

According to Table 6, the strategy evaluation experts believe that the overall feasibility and adaptability of the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province are at the highest level, which are (\bar{x} =4.51) and (\bar{x} =4.68), respectively. However, the strategy evaluation experts believe that the feasibility of the enterprise-level strategy is at a high level (\bar{x} =4.31), and the rest are at the highest level.

4. Discussion

These strategies and measures are crucial to improving the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. The following discussion will support this conclusion based on relevant references.

Government-level strategies are the basic guarantee for improving the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. Research shows that the government provides policy guidance for industry-education integration, increases financial investment, formulates overall plans, social publicity and promotion, and strengthens the construction of talent teams, which provide specific implementation paths and guarantee measures for industry-education integration (Busemeyer & Trampusch, 2012). These measures have jointly promoted the in-depth development of industry-education integration and provided strong talent and intellectual support for economic and social development (Ministry of Education of the People's Republic of China, 2020).

Vocational college-level strategies are key factors in improving the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. Research shows that measures such as strengthening school-enterprise cooperation, increasing financial investment, strengthening faculty team construction, optimizing curriculum system, and establishing specialized institutions at the level of higher vocational colleges directly affect the sustainable development of industry-education integration (Li, 2016; Shen, 2020). These measures not only improve the quality of education and the level of school management in higher vocational colleges, but also provide students with more learning and employment opportunities related to actual work (Wheclahan, Buchanan & Yu, 2015).

Enterprise-level strategies are an indispensable and important force to improve the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. Research shows that measures such as strengthening school-enterprise cooperation with higher vocational colleges, setting up special funds, providing practical training opportunities, paying attention to market trends, and providing sufficient human resources at the enterprise level ensure that the educational content is closely connected with industrial needs (Dong, 2019). Enterprises have played a positive role in the integration of industry and education, and have made important contributions to cultivating more high-quality skilled talents and promoting industrial upgrading and transformation (Perkins Act, 2018).

Student-level strategies are direct factors in improving the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. Research shows that measures such as actively participating in internships, strengthening exchanges with enterprises, improving professional skills, and strengthening independent learning at the student level not only deepen students' understanding of professional knowledge, but also improve their practical operation ability and problem-solving ability (Zhang & Wang, 2020). By participating in actual projects and work in enterprises, students can exercise their teamwork, communication and organizational coordination skills, thereby effectively improving their professional ability and competitiveness (Liu & Zhao, 2020).

In summary, based on the support of relevant reference materials, the strategies and measures proposed in this study are essential to improving the sustainable development of industry-education integration in higher vocational colleges in Guangdong Province. The sustainable development of industry-education integration in higher vocational colleges in Guangdong Province can be effectively improved by strengthening strategies at four levels: government, higher vocational colleges, enterprises and students. These factors are interrelated and mutually reinforcing, and together they have promoted the comprehensive development of industry-education integration. However, it should be noted that different regions may face unique challenges and backgrounds, so the implementation of these strategies should be adjusted and optimized accordingly (Busemeyer & Trampusch, 2012).

5. Recommendations

The following are some potential areas for future research in the field of improving the sustainable development of industry-education integration in Guangdong's higher vocational institutions:

Innovation in the mode of industry-teaching integration: Deepen the school-enterprise cooperation mechanism and study how to deepen further the cooperation between higher vocational colleges and industrial enterprises to establish a closer, long-term cooperative relationship (OECD, 2018). Explore the cooperation mode of benefit sharing and risk sharing, and promote the development of school-enterprise cooperation to a deeper level and broader field. Build a community for integration of industry and education, and study how to build a community for integration of industry and education with the participation of the government, schools, industries, and enterprises to realize the sharing of resources and complement each other's advantages (Yang, 2021). Through the construction of the community, the deep integration of vocational education and industrial development is promoted.

Curriculum system and teaching content reform: Optimize the curriculum system according to industrial demand

and study how to optimize the curriculum system of higher vocational colleges and universities according to industrial development trends and market demand (Müller & Gangl, 2019). Increase the number of specialized courses related to emerging industries and advanced technologies to enhance students' professionalism and competitiveness in employment. Implement action-oriented teaching, explore the action-oriented teaching mode combining "teaching, learning and doing," and emphasize cultivating students' practical and innovative abilities. Students can learn and grow in practice through project-based learning and work-learning alternation (Amano, 2018).

Construction of quality assurance and evaluation system: Establish a quality assurance system for the integration of industry and education, study how to establish a scientific and comprehensive quality assurance system for the integration of industry and education, and monitor and evaluate the process and results of the integration of industry and education (BIBB, 2021). Ensure the quality and effect of integrating industry and education by formulating quality standards and establishing evaluation mechanisms. Improve the evaluation mechanism of talent cultivation, explore diversified mechanisms, and emphasize the evaluation of students' comprehensive quality and ability. We can fully understand students' vocational quality and practical ability through enterprise and social evaluation and provide targeted improvement suggestions for talent cultivation (World Bank, 2021).

Policy support and regulatory guarantee: Study the policy incentive mechanism and explore how to promote the integration of higher vocational colleges and enterprises through policy incentives and financial support (Ministry of Education of the People's Republic of China, 2020). Research and formulate relevant policies and measures to encourage enterprises to participate in vocational education and support higher vocational colleges and universities in industry-education integration programs. Improve the regulatory system, study how to improve the regulatory system related to the integration of industry and education, and clarify the rights and obligations of all parties in the integration of industry and education. Through the formulation of relevant laws and regulations, the smooth integration of industry and education and the adequate protection of the rights and interests of all parties can be guaranteed (Perkins Act, 2018).

By exploring these future research directions, scholars and practitioners can promote a deeper understanding of the strategies of higher vocational institutions to improve the sustainable development of the integration of industry and education. The in-depth exploration and practice of these research areas will help promote the sustainable integration of industry and education in higher vocational institutions in Guangdong Province.

Acknowledgments

This paper is a research paper on the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province. I want to express my sincere gratitude to every voluntary participant who contributed to the data collection process. Finally, I would like to thank my primary supervisor and the editors of Higher Education Studies for taking the time to guide my paper.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned, externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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References

- Amano, I. (2018). Japan's vocational education system and its development. *Journal of Asian Studies*, 45(3), 567-589. <https://doi.org/10.2307/jas.45.3.567>
- BIBB. (2021). *Vocational education and training in Germany*. Federal Institute for Vocational Education and Training. Retrieved from <https://www.bibb.de>
- Bussemeyer, M. R., & Trampusch, C. (2012). *The political economy of collective skill formation*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199599431.001.0001>
- Chai, M. (2020). Exploration and practice of the "five-double-integration" talent cultivation mode in higher vocational colleges and universities for industry-teaching integration. *Mechanical Vocational Education*, 9, 28-31. <https://doi.org/10.16309/j.cnki.issn.1007-1776.2020.09.007>
- Dong, G. (2019). Reflections on the high-quality development of higher vocational education in the new era. *China Vocational and Technical Education*, 7, 49-51.
- Li, J. (2016). Exploration of the interest demands and governance logic of member units of vocational education groups. *Vocational and Technical Education*, 37(16), 24-28. <https://doi.org/10.2753/CED1061-1932240316>
- Liao, H. (2017). *Research on the operation mechanism of industry-teaching integration in higher vocational education in Guangdong Province* [Master's thesis, Guangdong Technical Normal College].
- Liu, L., & Zhao, K. (2020). Analysis of talent cultivation mode of typical higher vocational colleges and universities through "integration of industry and education, school-enterprise cooperation". *Modern Business Industry*, 41(36), 66-67. <https://doi.org/10.19311/j.cnki.1672-3198.2020.36.031>
- Ministry of Education of the People's Republic of China. (2020). *Summary of the pilot work on modern apprenticeship*. Retrieved from <http://www.moe.gov.cn>
- Müller, W., & Gangl, M. (2019). *Transitions from education to work in Europe: The integration of youth into EU labour markets*. Oxford University Press.
- Nini, Z. (2024). Research and practice of the "three teachings" reform in vocational college English teaching under the background of industry-education integration. *Journal of Educational Research and Policies*. <https://doi.org/10.62517/jhet.202415422>
- OECD. (2018). *Education 2030: The future of vocational education*. OECD Publishing.
- Perkins Act. (2018). *Strengthening Career and Technical Education for the 21st Century Act*. Retrieved from <https://www.congress.gov/bills/115th-congress/house-bill/2353>
- Polonium, Y. (2022). Skill formation and regional innovation: A functional analysis of school-enterprise cooperation in vocational education. *China Education Fiscal Policy Consultation Report (2019-2021)*, 5. <https://doi.org/10.26914/c.cnkihy.2022.000985>
- Shen, M. (2020). *Research on realization mechanism of industry-teaching integration and school-enterprise cooperation in Yunnan vocational education* [Master's thesis, Yunnan University].
- Sun, W-P., & Wang, R.-H. (2008). Research on the mechanism of combining industry, academia, and research in vocational education. *Journal of Chongqing Vocational and Technical College*, 4, 1-3.
- Wang, Z. (2019). Thinking and practice of higher vocational accounting specialization construction in the context of industry-teaching integration: Taking the accounting specialization of Zhejiang Financial Vocational College as an example. *Modern Vocational Education*, 31, 226-227.
- Wheelahan, L., Buchanan, J., & Yu, S. (2015). *Linking qualifications and the labor market through capabilities and vocational streams*. NCVER.
- World Bank. (2021). *Skills development in South Asia: Trends and challenges*. World Bank Group.
- Yang, S. S. (2021). *Research on school-enterprise cooperation mode of higher vocational colleges and universities based on practical ability cultivation* [Master's thesis, Wuhan University of Technology]. <https://doi.org/10.27381/d.cnki.gwlg.2021.001917>

Yiwen, W. (2023). The dilemma and Strategy of Vocational Undergraduate Talent Training in Guangdong Province from the perspective of industry-education integration. *Vocational Education*. <https://doi.org/10.12677/ve.2023.126144>

Zhang, X., & Wang, J. (2020). A study on the mechanism of industry-education integration based on synergy theory. *Higher Vocational Education Research*, 12(3), 15-22.

Appendix

Appendix A

Analysis result of the current status of industry-education integration in higher vocational colleges in Guangdong Province

Table 1.1 Mean and standard deviation of students' performance in the integration of industry and education in higher vocational colleges in Guangdong Province

Students n=384, Teachers n=361

Students' performance in the development of industry-education integration	Students				Teachers			
	\bar{X}	S.D.	Level	Order	\bar{X}	S.D.	Level	Order
1. Industry-education integration is of great help to the study and future of higher vocational students	3.81	0.77	high	6	4.36	0.61	high	1
2. Industry-education integration can help higher vocational students better understand professional knowledge	3.87	0.77	high	3	4.14	0.50	high	4
3. Industry-education integration can help higher vocational students better understand the actual working environment	3.89	0.89	high	2	4.15	0.54	high	3
4. Industry-education integration can help higher vocational students better understand the job requirements of enterprises	3.94	0.88	high	1	4.17	0.51	high	2
5. Industry-education integration can significantly improve the employment competitiveness of higher vocational students	3.84	0.80	high	4	4.36	0.62	high	1
6. Students are willing to participate in activities of industry-education integration	3.82	0.82	high	5	4.06	0.55	high	5
Total	3.86	0.82	high		4.21	0.55	high	

Table 1.2 Mean and standard deviation of teachers' performance in the development of the integration of industry and education in Guangdong Province

Students n=384, Teachers n=361

Performance of higher vocational colleges in the development of industry-education integration	Students				Teachers			
	\bar{X}	S.D.	Level	Order	\bar{X}	S.D.	Level	Order
1. Higher vocational colleges have a positive attitude towards promoting industry-education integration	3.83	0.89	high	1	4.34	0.63	high	1
2. Higher vocational colleges have sufficient funds for industry-education integration	3.65	0.80	high	6	3.99	0.56	high	7
3. Higher vocational colleges have strong faculty in industry-education integration	3.78	0.82	high	3	4.13	0.67	high	3
4. Higher vocational colleges have perfect implementation plans for industry-education integration policies	3.72	0.77	high	5	4.03	0.63	high	6
5. Higher vocational colleges' industry-education integration courses or activities are in line with actual work needs	3.76	0.84	high	4	4.14	0.64	high	2
6. Higher vocational colleges have good results in cultivating talents for industry-education integration (professional settings, curriculum construction, internships and training, etc.)	3.82	0.82	high	2	4.04	0.52	high	5
7. Higher vocational colleges have good results in building a team of industry-education integration faculty (part-time teachers from enterprises, industry expert teachers, etc.)	3.72	0.78	high	5	4.06	0.65	high	4
8. Higher vocational colleges have good results in building industry-education integration platforms (industry colleges, internship and training bases, etc.)	3.78	0.85	high	3	4.06	0.63	high	4
Total	3.76	0.82	high		4.10	0.62	high	

Table 1.3. Mean and standard deviation of enterprise performance in developing industry-education integration.

Students n=384, Teachers n=361

Enterprises' performance in the development of industry-education integration	Students				Teachers			
	\bar{X}	S.D.	Level	Order	\bar{X}	S.D.	Level	Order
1. Enterprises are deeply involved in industry-education integration projects	3.53	0.81	high	6	3.96	0.60	high	2
2. Enterprises have a positive attitude in promoting industry-education integration	3.66	0.80	high	3	3.93	0.55	high	4
3. Enterprises play an active role in student internships and employment in industry-education integration	3.72	0.79	high	1	4.10	0.60	high	1
4. Enterprises provide sufficient funds for industry-education integration	3.57	0.84	high	5	3.83	0.65	high	6
5. Enterprises provide sufficient human resources for industry-education integration	3.61	0.83	high	4	3.90	0.55	high	5
6. Enterprises provide sufficient equipment for industry-education integration	3.68	0.78	high	2	3.95	0.59	high	3
Total	3.63	0.81	high		3.95	0.59	high	

Table 1.4. Mean and standard deviation of government performance in the development of industry-education integration

Students n=384, Teachers n=361

Government performance in the development of industry-education integration	Students				Teachers			
	\bar{X}	S.D.	Level	Order	\bar{X}	S.D.	Level	Order
1. The government is deeply involved in the industry-education integration projects of higher vocational colleges	3.66	0.80	high	3	3.60	0.67	high	5
2. The government plays a good role in promoting the industry-education integration of higher vocational colleges	3.64	0.85	high	4	3.79	0.66	high	3
3. The government provides a complete system guarantee for the industry-education integration of higher vocational colleges	3.77	0.76	high	1	3.88	0.62	high	1
4. The government provides sufficient financial support for the industry-education integration projects of higher vocational colleges	3.62	0.90	high	5	3.74	0.72	high	4
5. The government provides sufficient human resources support for the industry-education integration projects of higher vocational colleges	3.72	0.81	high	2	3.85	0.67	high	2
6. The government provides other support for the industry-education integration projects of higher vocational colleges	3.64	0.89	high	4	3.54	0.84	high	6
Total	3.68	0.83	high		3.73	0.70	high	

Evaluation of the adaptability and feasibility analysis results of the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province

Table 1.5. Mean and standard deviation strategies for sustainable development of industry-education integration in higher vocational colleges at the Guangdong Province-government level

Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province—Government-level strategies	Feasibility			Adaptability		
	\bar{X}	S.D.	Level	\bar{X}	S.D.	Level
1. Strengthen the formulation of industry-education integration policies, establish supervision, evaluation, and feedback mechanisms, and continuously improve them.	4.64	0.49	highest	4.76	0.44	highest
2. Increase financial support and tax incentives and establish special funds for industry-education integration.	4.36	0.57	high	4.72	0.46	highest
3. Formulate an overall plan and implementation plan for integrating industry and education and establish an industry-education integration platform.	4.32	0.48	high	4.72	0.54	highest
4. Strengthen the publicity and promotion of vocational education and encourage enterprises and higher vocational colleges to participate deeply in industry-education integration activities.	4.64	0.49	highest	4.64	0.57	highest
5. Strengthen the construction of a talent team integrating industry and education.	4.52	0.51	highest	4.68	0.48	highest
Total	4.50	0.51	highest	4.70	0.50	highest

Table 1.6. Mean and standard deviation of the strategy for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province - higher vocational college level

Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province—Higher vocational college-level Strategies	Feasibility			Adaptability		
	\bar{X}	S.D.	Level	\bar{X}	S.D.	Level
1. Strengthen school-enterprise cooperation, maintain a smooth communication mechanism, jointly build on-campus and off-campus internship and training bases, and jointly apply for and develop projects.	4.76	0.44	highest	4.80	0.41	highest
2. Actively seek policy and financial support and increase investment in industry-education integration.	4.44	0.71	high	4.64	0.49	highest
3. Strengthen the construction of the teaching staff (hiring enterprise mentors, teachers to practice in enterprises, teacher training, etc.)	4.76	0.44	highest	4.84	0.37	highest
4. Optimize the curriculum system and talent training model (professional setting, curriculum construction, internship training, teaching material development, etc.)	4.76	0.44	highest	4.76	0.44	highest
5. Establish a coordination organization for integrating industry, education, and school-enterprise cooperation.	4.68	0.56	highest	4.72	0.46	highest
Total	4.68	0.52	highest	4.75	0.43	highest

Table 1.7. Mean and standard deviation of the strategy for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province - enterprise level

Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province—Enterprise-level strategy	Feasibility			Adaptability		
	\bar{X}	S.D.	Level	\bar{X}	S.D.	Level
1. Strengthen school-enterprise cooperation, jointly build on-campus and off-campus training bases, and actively participate in higher vocational colleges' professional construction, curriculum development, and personnel training.	4.44	0.51	high	4.72	0.46	highest
2. Increase resources, equipment, technology, and financial support for integrating industry and education and establish special funds for integrating industry and education.	3.92	0.70	high	4.64	0.49	highest
3. Regularly hold industry-education integration lectures, seminars, company open days, and other activities to provide students with sufficient internship and training opportunities.	4.44	0.58	high	4.72	0.46	highest
4. Continue to pay attention to policy trends, technological innovations, and changes in market demand.	4.52	0.51	highest	4.64	0.49	highest
5. Provide sufficient human resources to meet the needs of industry-education integration.	4.24	0.52	high	4.68	0.48	highest
Total	4.31	0.57	high	4.68	0.47	highest

Table 1.8. Mean and standard deviation strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province-student level

Strategies for sustainable development of industry-education integration in higher vocational colleges in Guangdong Province—Student-level strategy	Feasibility			Adaptability		
	\bar{X}	S.D.	Level	\bar{X}	S.D.	Level
1. Participate in internships, practical training, extracurricular practice, innovation and entrepreneurship, and other activities.	4.68	0.48	highest	4.72	0.46	highest
2. Actively communicate and exchange with enterprises and pay attention to market demand and industry trends.	4.40	0.58	high	4.56	0.51	highest
3. Continuously improve professional skills and practical abilities and actively obtain skills or professional qualification certificates.	4.56	0.51	highest	4.60	0.50	highest
4. Continuously strengthen independent learning, humanistic qualities, teamwork, innovation, and entrepreneurship capabilities.	4.60	0.50	highest	4.48	0.51	highest
Total	4.56	0.52	highest	4.59	0.49	highest

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