STRATEGIES OF DEVELOPMENT FOR INDUSTRY-EDUCATION INTEGRATION OF APPLICATION-ORIENTED UNIVERSITIES IN GUANGXI

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A thesis submitted in partial fulfillment of the requirements for

the Degree of Doctor of Philosophy Program in Educational Administration

Academic Year 2022

Thesis Title Strategies Development for Industry-education Integration Application-Oriented Universities in Guangxi

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ABSTRACT

The objectives of this research were: 1) to study the level of industry-education integration of Application-oriented Universities in Guangxi, 2) to develop strategies of development for industry-education integration of Application-oriented Universities in Guangxi, 3) to evaluate the strategies of development of industry-education integration of Application-oriented Universities in Guangxi. The sample group included 155 managers involved in the industry-education integration from 10 Application-oriented Universities in Guangxi. The research instruments involved: 1) questionnaire, 2) structured interviews, and 3) expert strategy evaluation. The data were analyzed by percentage, average value, and standard deviation.

The research results show that: the level of industry-education integration in Guangxi Application-oriented Universities in overall was at medium level. Consider for the result of the study aspects ranged from the highest to the lowest level were as following: the highest level was management Mechanism, followed by talent Development, and financial Management was the lowest level. For strategies of development for industry-education integration of application-oriented universities in Guangxi, the researcher proposes: 1) improving teacher resources management, 2) supporting financial management, 3) promoting management mechanism, and 4) promoting talent development, there are 4 strategies with a total of 20 measures. The adaptability and feasibility evaluation results of the strategies are at high level.

Keywords: Strategies of development, Industry-education integration, Application-oriented Universities

ชื่อเรื่อง **กลยุทธ์การพัฒนาการจัดการศึกษาแบบบูรณาการภาคอุตสาหกรรมในมหาวิทยาลัยที่เน้นการประยุกต์ใช้ในมณฑลกวางสี**
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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์ 1) เพื่อศึกษาระดับการจัดการศึกษาแบบบูรณาการภาคอุตสาหกรรมในมหาวิทยาลัยที่เน้นการประยุกต์ใช้ในมณฑลกวางสี 2) เพื่อพัฒนากลยุทธ์การพัฒนาการจัดการศึกษาแบบบูรณาการภาคอุตสาหกรรมในมหาวิทยาลัยที่เน้นการประยุกต์ใช้ในมณฑลกวางสี และ 3) เพื่อประเมินกลยุทธ์การพัฒนาการจัดการศึกษาแบบบูรณาการภาคอุตสาหกรรมในมหาวิทยาลัยที่เน้นการประยุกต์ใช้ในมณฑลกวางสี ใน 4 ด้าน ประกอบด้วย 1) การจัดการทรัพยากรครู 2) การจัดการการเงิน 3) กลไกการจัดการ และ 4) การอบรมบุคลากรที่มีศักยภาพสูง กลุ่มตัวอย่างที่ใช้ในการวิจัยครั้งนี้ ได้แก่ ผู้มีส่วนเกี่ยวข้องในการจัดการศึกษาแบบบูรณาการภาคอุตสาหกรรม จากมหาวิทยาลัย 10 แห่ง รวมทั้งสิ้น 155 คน เครื่องมือที่ใช้ในการวิจัย ได้แก่ แบบสอบถาม แบบสัมภาษณ์และแบบประเมิน สถิติที่ใช้ในการวิเคราะห์ข้อมูล ได้แก่ ค่าร้อยละ ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตราฐาน

ผลการวิจัยพบว่า ระดับการจัดการศึกษาแบบบูรณาการภาคอุตสาหกรรมในมหาวิทยาลัยที่เน้นการประยุกต์ใช้ในมณฑลกวางสีโดยภาพรวมอยู่ในระดับปานกลาง เมื่อพิจารณารายด้าน พบว่า ด้านกลไกการจัดการ มีค่าเฉลี่ยสูงสุด รองลงมาคือด้านการอบรมบุคลากรที่มีศักยภาพสูง ส่วนการจัดการการเงิน มีค่าเฉลี่ยต่ำสุด การพัฒนากลยุทธ์การพัฒนาการจัดการศึกษาแบบบูรณาการภาคอุตสาหกรรม ประกอบด้วย 4 ด้าน ได้แก่ 1) ส่งเสริมกลไกการจัดการ 2) ส่งเสริมการอบรมบุคลากรที่มีศักยภาพสูง 3) พัฒนาการจัดการทรัพยากรครู และ 4) สนับสนุนการจัดการการเงินและ20 มาตรการ ผลการประเมินความเหมาะสมและความเป็นไปได้ของกลยุทธ์การพัฒนากลยุทธ์การพัฒนาการจัดการศึกษาแบบบูรณาการภาคอุตสาหกรรมในมหาวิทยาลัยที่เน้นการประยุกต์ใช้ในมณฑลกวางสี มีค่าเฉลี่ยอยู่ในระดับสูง

คำสำคัญ กลยุทธ์การพัฒนา การจัดการศึกษาแบบบูรณาการ มหาวิทยาลัยที่เน้นการประยุกต์ใช้

Acknowledgements

As I approach the end of my three years of study in Thailand, I would like to express my sincere gratitude to Bansomdejchaopraya Rajabhat University! I think I am fortunate to have met a lovely and respectful group of teachers and a group of like-minded students here, and I have gained the warmth and enthusiasm of all of you as I have enjoyed my academic success.

I was fortunate to be able to carry out my PhD research under the supervision of Assistant Professor Dr. Patchara Dechhome, whose profound academic knowledge and rigorous, meticulous approach to learning were all examples for me to follow. I would also like to thank my co-advisor.

I would also like to thank my co-advisors, Associate Professor Dr. Niran Sutheeniran and Assistant Professor Dr. Kulsirin Aphiratvoradej, who have helped me tremendously in my PhD studies and from whom I have learned so much. I have learnt a lot from them. I think that without them, my journey would not have been so smooth.

In addition, I would like to thank Assistant Professor Dr. Sarayuth Sethakhajorn, Professor Yuan Lei, Miss Natchaya Pukkaewsri, and the many teachers and students who have helped me! I would like to thank Xiong Jianwen, Ma Yaqin, Wang Jingjing and Yang Xiaofeng for lending a helping hand when I was facing difficulties.

Thank you all again, thank you!

Chen Guoying

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Chapter 1
Introduction

Rationale

The proposed type of university "application-oriented universities" follows the research paradigm of typology. Based on the actual operation of universities, higher education administrators and higher education researchers use discursive research or ideal type method to propose "application-oriented university" as an ideal type of higher education, and theoretically summarize the basic characteristics of "application-oriented university" and the path of building "application-oriented university". Theoretically, the basic characteristics of "application-oriented universities" and the path of building an application-oriented universities have been summarized. Chinese scholars believe that "application-oriented universities" is a new type of university that emerges and develops along with the massification of higher education in China (Hu, 2013).

In 2015, the Chinese Ministry of Education, National Development and Reform Commission, and the Ministry of Finance jointly issued the Guidance on Guiding Some Local Undergraduate Universities to Transform into Application-oriented Universities, which addresses the structural contradictions of Chinese higher education, the serious tendency of homogenization, the difficulty and low quality of employment of graduates, and the weak capacity of local universities to serve regional economic and social development, and proposes to guide some local undergraduate universities to The document puts forward the goal of guiding some local general undergraduate universities to transform into application-oriented universities, as well as the requirements for application-oriented universities to serve local economic and social development, integrate industry and education, and cultivate application-oriented talents. Subsequently, "cultivating application-oriented talents and building application-oriented universities" have become the orientation of new undergraduate universities, local undergraduate

universities and private undergraduate universities, which occupy an important position in the pattern of higher education in China.

Guangxi is located in the southwest of China and is a province with relatively backward higher education resources and industrial development. There are 19 application-oriented universities in Guangxi, and these universities are generally facing the challenges and opportunities to transform into application-oriented universities. Deepening the integration of industry and education is an important part of China's higher education reform. The industrial structure differs from place to place, and the difficulties and problems faced by the integration and development of universities and local industries are also different.

Liuzhou Institute of Technology is located in Liuzhou City, Guangxi Zhuang Autonomous Region. It is a private local undergraduate university. It is a municipal university built by Liuzhou city government to serve the needs of local industrial development. I have been working at Liuzhou Institute of Technology since 2007, and I have been the Dean of the School of Design and Art of Liuzhou University since 2014. in 2015, the Chinese Ministry of Education put forward a policy calling for local undergraduate institutions to transform into application-oriented universities, and Liuzhou Institute of Technology quickly responded to the call of the national Ministry of Education with the goal of transforming into an application-oriented universities to cultivate applied talents and serve the development needs of local industries.

One of the important links for local undergraduate institutions to realize the transformation of application-oriented universities is to integrate and develop with local industries, and let industries participate in the talent cultivation and teaching links of universities. So far, it has been seven years since Liuzhou Institute of Technology proposed the goal of transformation to an application-oriented universities. Among the 19 application-oriented universities in Guangxi, some universities have carried out deep industrial integration and achieved good development in professional construction, teaching reform and talent development. However, there are also some universities that develop slowly and are not closely integrated with industry, and the development of each

university varies greatly. So I often reflect on what causes these differences. As a middle manager of Liuzhou Institute of Technology, what should I do to help our school to improve the management level of application-oriented universities and make better development. In response to the above questions, I often discussed with managers of related universities, and constantly reviewed literature, learned relevant theoretical knowledge, and analyzed management strategies of other universities.

After continuous learning and thinking, I realized that to achieve the goal of transformation to an application-oriented universities, it is necessary to have a matching management strategy of an application-oriented universities to promote the integration of industry and education, so as to improve the quality of talent cultivation in the university and achieve the transformation and development goals of an application-oriented universities.

Based on the above, I decided to conduct the "Strategies of development for industry-education integration of Application-oriented Universities in Guangxi" research. Based on the theories of educational management and industry-education integration, this study will analyze the current situation of industry-education integration and its causes through research methods such as questionnaires and interviews, use statistical analysis techniques, propose management strategies for industry-education integration of application-oriented universities in Guangxi on this basis, and evaluate the feasibility of the proposed management strategies. We hope to provide some references for the management of application-oriented universities and the transformation and development of application-oriented universities.

Research Questions

1. What is the level of industry-education integration of Application-oriented Universities in Guangxi?

2. What is the strategies of development for industry-education integration of Application-oriented Universities in Guangxi?

3 . Are the strategies of development for industry-education integration of Application-oriented Universities in Guangxi applicable and feasible?

Objectives

1. To study the level of industry-education integration of Application-oriented Universities in Guangxi.

2. To develop strategies of development for industry-education integration of Application-oriented Universities in Guangxi.

3. To evaluate the strategies of development of industry-education integration of Application-oriented Universities in Guangxi.

Scope of the Research

Population and the Sample Group

Population

The Population of this research were 10 application-oriented Universities in Guangxi. Totaling 259 managers of industry-education integration.

The Sample Group

According to Krejcie and Morgan (1970) sampling table, the sample group were manager who involved in the industry-education integration at application-oriented university in Guangxi. They were selected by purposive sampling method from 10 universities which located in different city in Guangxi, and used by systematic random sampling, totaling 155 people.

The 10 universities selected include: The 10 universities selected include: Nanning University, Liuzhou Institute of Technology, Guilin University, Guangxi Science & Technology Normal University, Baise University, Hechi University, Hezhou University, Wuzhou University, Beibu Gulf University, Yulin Normal University. Among them, Nanning University, Liuzhou Institute of Technology, Guilin University are private universities; the rest are public universities.

Interview

In this study, 10 people from Guangxi application-oriented universities will be interviewed in this study to understand the current situation of the integration of industry-education in Guangxi application-oriented universities. The interviewees must meet the following criteria**:** 1) middle managers of Guangxi application-oriented universities who had been involved in the management of the integration of education and industry for 10 years or more; 2) were familiar with the operation mode of enterprises and universities and had a deeper understanding of the integration of education and industry; 3) must be willing to participate in the recorded semi-structured interviews; and 4) must be willing to review their interview transcripts for validation.

Evaluation

Based on the actual situation of the integration of industry-education work in application-oriented universities, five people are selected to evaluate the management strategy of Guangxi application-oriented universities based on the integration of industry-education, who meet the following conditions: 1) managers who have been involved in the integration of industry-education work for 5 years or more; 2) come from different universities; 3) have a senior title or doctorate degree and have a deeper understanding and research on the integration of industry-education work.

The Variable

By reviewing the literature related to this study and counting the features mentioned in the industry-education integration, the features with a frequency of 6 and above were selected as variables for this study, and they include: 1) teacher resources management, 2) financial management, 3) management mechanism, and 4) talent development.

Definition of Terms

Industry-education integration

industry-education integration refers to The Integration of industry and education refers to the close combination of industry and teaching, mutual support and mutual promotion, and the formation of a school-running mode for the integrated development of schools and industry. The Integration of industry and education is not simply an "upgraded version" of school-enterprise cooperation. There are both similarities and differences. The similarities are reflected in the Integration of industry and education and school-enterprise cooperation are both an educational concept and a talent development mode, which emphasizes the close cooperation between schools and enterprises and collaborative education. The difference is reflected in the former is the result, focusing on the change of management system, that is, through the stable, efficient and deep cooperation relationship, finally make the industry enterprises and higher vocational colleges develop into a talent supply and demand community; the latter is the means, emphasizing the school mode change, focus on the practicality and effectiveness of talent, its limited depth of cooperation and breadth. Industry-education integration consisted of four following aspects: 1) Teacher resources management, 2) Financial management, 3) Management mechanism, 4) Talent development.

Teacher resources management

Teacher resource management refers to the management of the school's teaching force through management activities such as planning, organising, leading and controlling, with the aim of improving the quality of teaching, enhancing the quality of teachers and improving teaching effectiveness. It contains: staffing, performance assessment, talent selection, position promotion, teacher evaluation system and other personnel organisation contents; teacher ethics education, teacher behaviour, teacher professional conduct, sense of responsibility and mission and other teacher ethics construction contents; teacher recruitment, study seminars, talent selection, title assessment, career planning and other teacher development aspects. The teacher resource management model is related to the achievement of the university's development goals and talent

training objectives. Under the concept of industry-education integration, "dual-teacher teachers" and "teacher evaluation and growth system" have received widespread attention from scholars.

Financial management

Financial management is the process of raising, allocating, using and monitoring funds in a rational manner to achieve financial objectives and to ensure the long-term development and stable operation of an enterprise or organisation in the course of its operation. Financial management includes financial decision-making, financial control, financial analysis and other aspects. Its main objective is to achieve effective management and use of funds in order to maximise the return on corporate wealth value and profit. The financial management of the industry-education integration includes the source of funds, funding input, planning and budgeting, resource allocation, financial supervision and risk management, etc. It also involves the allocation of inputs and interests between universities and enterprises. In the context of the industry-education integration, "diversified input methods" and "distribution of university-enterprise rights and interests" have received attention from academics.

Management mechanism

Management mechanism refers to the process of establishing a set of management system framework within an organisation by developing various types of management regulations, processes and standards, and relying on the organisational structure to advance work, ensure management efficiency, quality, accuracy and stability, and achieve organisational goals. The mechanism can include various management systems, such as financial management, human resource management, teaching management, risk management, knowledge management, etc., which can be improved and adjusted according to the needs and characteristics of different organisations. It can be a motivation mechanism, operation mechanism, evaluation mechanism, sharing mechanism, cooperation and trust mechanism, benefit distribution mechanism, etc. Each mechanism should have a clear division of responsibilities, clear role requirements, defined workflow and process control, effective monitoring and tracking, scientific performance allocation

and incentive mechanism, and corresponding evaluation and improvement mechanism. Through effective management mechanisms, organisations can improve the transparency, science and effectiveness of their management, stimulate the initiative and motivation of their staff, and improve operational efficiency and economic effectiveness, thereby gaining a better competitive advantage and sustainable development.

Talent development

Talent development refers to the comprehensive, systematic, professional and practical training of talents under a specific education and training system to equip them with comprehensive qualities such as knowledge, skills, abilities and literacy that meet the needs of a specific job, occupation or society to meet the needs of socio-economic development. Talent development can include various forms and stages of learning, such as school and university education, vocational training, internships, postgraduate studies, professional skills certification, etc. Talent development is influenced by educational philosophy, professional orientation, curriculum system, teaching management, teacher competence, practical conditions, teaching resources, school-enterprise cooperation and platform construction. At present, education concepts such as "integration of specialisation and innovation, and integration of industry - education" have attracted the attention of many education researchers. However, different fields and universities have different educational philosophies and training objectives. In general, the purpose of talent training is to meet the needs of enterprises or organisations for talent and to promote their sustainable development and progress, as well as to cultivate the various types of talents needed for the development of the country in various fields.

Application-oriented Universities

Application-oriented university refers to an undergraduate higher education institution with application-oriented orientation, focusing on undergraduate education, as opposed to the concept of academic university. Applied undergraduate education plays a positive role in meeting China's economic and social development, the need for high-level applied talents as well as promoting the process of massification of higher education in China, and is a major decision deployment of the Chinese State Council to guide some

local undergraduate universities to transform into applied ones. They basically have the following common characteristics: 1) the goal of running education is not based on the pursuit of knowledge per se, but to meet the demand for applied talents for economic and social development; 2) the form of running education is characterized by the integration of industry and education; 3) the level of running education is usually a general undergraduate university, including some local traditional undergraduate universities and new undergraduate universities.

Strategies of Development

Strategies of development is the theoretical system of how an organisation develops. Strategies of development is a major choice, planning and strategy for the development direction, speed and quality of development, development points and development capabilities of an organisation within a certain period of time. strategies of development can help an organisation to guide its long-term development direction, specify its development goals, identify its development points as well as the real purpose of strategies of development is to solve the development problems of the organisation and to achieve rapid, healthy and sustainable development of the organisation.

Research Framework

Based on the theories of educational management and industry-education integration, the research framework of this paper is show in Figure 1.1.

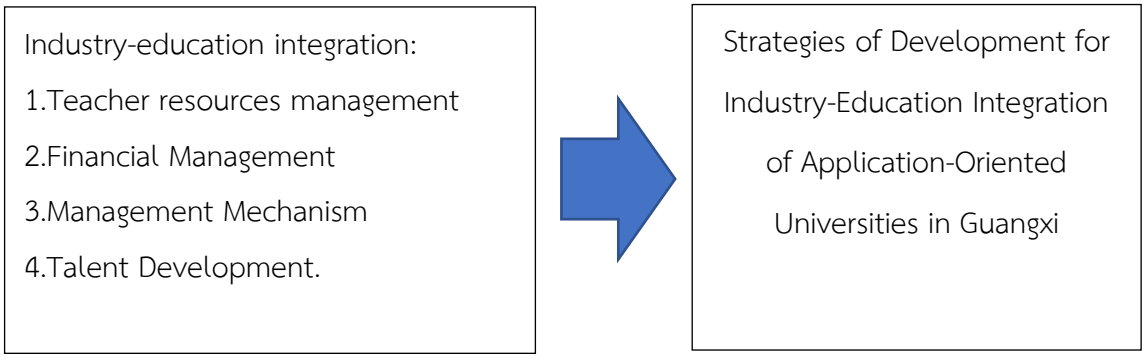

Figure 1.1 Research Framework

Chapter 2

Literature Review

This chapter will focus on the research questions raised in Chapter 1 and summarize the main theoretical basis and related researchers involved in this research, so as to clarify the theoretical inheritance, improvement and expansion relationship between this research and existing achievements. In order to explore the theoretical basis of the integration of industry and education in application-oriented universities, this chapter sets out the theories as follow:

1. Concept of Educational administration
2. Concept of Industry-education integration
3. Context of Application-oriented University
4. Related research

Concept of Educational administration

The idea of educational management has existed since the beginning of educational activities. However, the study of educational management as a specialized scientific object emerged only at a certain stage of development of educational management activities. Before the formation of a systematic discipline of educational management, educational practice was very rich in management ideas and experiences. Initially, these experiences and ideas were combined with human productive labor, in the course of which people transmitted management ideas and experiences. Specialized educational organizations arose at the emergence of slave societies at the dissolution of primitive societies. The ideas and experience of managing educational organizations were developed at the same time as they arose.

Before the 19th century, there was no independent educational administration in any country in the world, and the science of educational management was in its infancy. Educational management is the process of activity in which managers achieve educational

management goals efficiently by organizing and coordinating educational teams, giving full play to the role of educational human, financial and material resources and other information, and using various favorable conditions within education.

At the beginning of the 20th century, with the progress of industrialization, management science flourished. Taylor's scientific management movement and its use in educational administration promoted the development of the discipline of educational management. 1908 Squidden and Allen co-authored School Reports and School Effectiveness, which summarized the experience of schools in drawing on the ideas and methods of business management. 1901 Bergeret's Classroom Management, which analyzed the cost of running schools and studied the relationship between educational inputs and outputs.

The American Newlon's 1937 article on authoritarianism in school management was an attempt to transfer the methods of business management, to educational management. in 1949, the American Yoche emphasized in his book "School Management and the Improvement of Human Relations" that schools are a complex social group and that the responsibility of managers lies in the management process to promote the interaction of all employees. It is also an attempt to apply the ideas of business management in educational management.

The literature database search shows that recent studies related to educational management are mainly distributed in “higher education management", "education informatization", and "educational management system".

Higher Education Management

Yu XB. et al. (2020). Pan Maoyuan's thoughts on higher education management are centered on talent cultivation, academic-oriented, striving for first-class and pursuing excellence, and the specific contents mainly include the construction of modern university system, classification and positioning of universities and the development of characteristics, teaching development and management innovation, and the professionalization of education management cadres. The basic features of Pan Maoyuan's

thoughts on higher education management are the combination of tradition and reality, the balance of macro and micro, and the unity of theory and practice.

Zhu SX. (2018). It is found that higher education management fads show that the transplantation and application of management theories depend on the value objectives and organizational contexts of higher education management, and the lack of knowledge matrix and theoretical stability in higher education management is the inherent root of the rise and fall of management fads.

Feng Hongyan, Du Dawei. (2018). This paper proposes improvement suggestions in five aspects: establishing the goal of modernized urban community higher education management, constructing modernized urban community higher education management system, building modernized urban community higher education management platform, innovating modernized urban community higher education management investment mechanism, and building modernized urban community higher education management team, in an attempt to provide reference for the current urban community higher education management reform in China.

Cha Ziyang. (2017). It is proposed to optimize the higher education management function and promote the innovative development of higher education management in China through three dimensions: clarifying the concept of big data education management, promoting the construction of education management informatization, and creating a data-based professional faculty team.

Chen Simeng. (2017). It is believed that in the reform of higher education management, the government should transform government functions and change government roles, strengthen macro regulation and control, formulate and improve laws and regulations and supervision mechanisms, and ensure the orderly participation of multiple subjects in higher education governance according to law.

Dong Qing. (2016). It is believed that establishing humanistic management concept, creating humanistic management environment, formulating humanistic management system and improving teachers' humanistic qualities can strengthen the cultivation and

implementation of humanistic concept in higher education management and optimize the management mode of higher education under humanistic concept.

Zhang Jingjing, He Yuangui. (2016). It is found that the characteristic constitutive elements as the articulation point of globalization integration can reflect the specific advancement of the construction of higher education management system in China and the United States, and can fully enlarge its intrinsic development value, so as to create new ideas for the construction of higher education management system.

Tian Yilin, Yan Guangfen, Dong Wei. (2015). It is found that the co-authorship rate in the field of higher education management in China is low; the cooperative research team has small-world network characteristics and scale-free characteristics; the cooperative research team in the field of higher education management has basically formed with strong research strength, which shows that the cooperative research team of universities has become the main force of research in this field; the hotspots of research are prominent and in-depth, and the way of research focuses on the combination of higher education management and social development The research is focused on the application of higher education management and social development, which reflects the characteristics of the times.

Chen Wuyuan, Li Guangping. (2020). In the context of universalization of higher education, through exploring new development paths, deepening the reform of full credit teaching management system, constructing the organizational structure of multi-governance teaching management and strengthening the construction of information-based teaching management operation mechanism, so as to improve the management level and teaching quality, meet the development needs of college students, and promote the sustainable development of higher education at the universalization stage.

Liu ZT. (2020). It is proposed that to improve higher education evaluation system and enhance higher education governance capacity, it is necessary to first improve the relevant policies and regulations system, promote the separation of management and evaluation, clarify the responsibilities and rights of government, universities and social intermediary organizations in higher education governance and evaluation, and establish

a closer and more effective cooperation and dialogue mechanism among all subjects to achieve the maximum benefit of higher education as a whole.

Zheng W. (2020). Exploring the relationship between the original applied higher education and undergraduate vocational education after the Ministry of Education of China launched the pilot undergraduate vocational education and from the historical evolution of vocational education, through a comparative study with the undergraduate vocational education in major developed countries, we propose the idea that undergraduate applied education can be used to oversee undergraduate vocational education.

Jiang K, Wang TL. (2021). It is proposed that to promote the modernization of China's higher education governance system and governance capacity, it is necessary to establish the governance concept of legal governance, gradually improve the relationship between the government and higher education; build a modern university governance system with orderly operation and improve the capacity of autonomous management of universities; give full play to the wisdom of multiple subjects and improve the capacity of multiple governance of higher education.

Informationization of education

Yu Xiaohua, Cong Peiqing, Xu Xianlong. (2018). Based on the three observation dimensions of application and service system, information security system, and technical support and service foundation, 54 excellent practical cases at home and abroad are compiled and analyzed, revealing the core issues and development trends of current higher education management informatization, including integration of management services, business process reconstruction, positioning of IT strategic leadership, and service architecture based on cloud strategy, etc.; meanwhile. At the same time, the management informationization of the University of Michigan is analyzed as a typical case, showing the construction and development of the collaborative management mechanism from the germination to the establishment to the deepening of the game, as well as the synergy of organization, personnel, capital and system in the guarantee system.

Zhu Zhiting, Xu Qiuxuan, Wu Yonghe. (2021). Based on the analysis of the standard demand for the new infrastructure of education informatization, a standard demand

framework for the new infrastructure of education informatization is constructed from four levels: digital base, system specification, application scenario, and goal-led, in order to solve the problem of lack of standardized thinking and coordination in the construction of education informatization; finally, the standardized construction of the new infrastructure of education informatization is proposed to promote the new infrastructure of education informatization in terms of the goal, network platform, and security application, etc. Finally, ten action proposals are proposed to promote the standardization of the new infrastructure of education informatization in terms of objectives, network platforms, and security applications in order to provide insights for the development of new technology-driven digital transformation of education in China.

Chen Lin, et al. (2020). It is proposed to accelerate the innovation leadership of information wisdom theory, the theory of unity of knowledge, action and creation, and the theory of collaborative cognition at the theoretical level; accelerate the innovation leadership of education model, the leadership of teacher's contemporary sublimation, the innovation leadership of large education development, and the leadership of innovative education equity at the practical level.

Wan Kun, Ren Youqun. (2020). Comprehensive application of literature research, induction and deduction, firstly, analyzed the three layers of digital divide in the current development of basic education informatization: digital technology access divide, digital technology use divide, and literacy divide; secondly, proposed the operation of technology-enabled basic education informatization from three aspects, such as the connotation of technology-enabled, the operation logic of technology-enabled and the possible impact on basic education informatization Finally, from both theoretical and practical aspects, the implementation path of basic education informatization consisting of five levels, such as core layer, application layer, support layer, foundation layer and guarantee layer, is constructed to realize the transition from digital divide to technology empowerment.

Hu QT. (2019). Outlines the achievements of China's education informatization in the past 40 years from three aspects: theoretical exploration, practical application, and

social impact, and proposes to provide the source power of education informatization development through interdisciplinary integration of knowledge innovation forms; deepen theoretical research on education informatization through localized innovation; promote the integration of education and technology innovation through multi-level educational teaching changes; and in the process of application of intelligent information technology. In the process of applying intelligent information technology, we will prevent the risks brought by the false prosperity of education informatization and promote the healthy development of education informatization.

Rao Aijing, Wan Kun, Ren Youqun. (2019). The development strategies of county basic education informatization are proposed: improving the policy guarantee mechanism of county basic education informatization, guiding high-quality enterprises to participate in the supply of education informatization services, improving the training of teachers' information technology application ability, and transforming students' learning and evaluation methods, in order to promote the high-quality and balanced development of county basic education informatization.

Xie Youru, (2019). It is pointed out that the construction of smart campus should be oriented to education informatization 2.0, emphasize integration and innovation, pay attention to mechanism guarantee, and highlight regional characteristics. On this basis, the new development of smart campus application and research is proposed, with a view to providing ideological guidance and practical reference for the future construction and application of smart campus.

Chen Lin, Wang Junming, Chen Song. (2018). From three aspects of education informatization 2.0 and modernization development of vocational education, education informatization 2.0 and integration and innovation development of vocational education, education informatization 2.0 and core elements change of vocational education, focusing on how to better innovate and develop vocational education in the era of education informatization 2.0.

Li Zhaoyi, Yang Xiaohong. (2019). The paths of promoting the construction of "smart campus" ecological environment with multiple collaborations, building a resource model

with multiple, co-creation, sharing and services, building a hierarchical teaching model and developing a blended learning model for the professionalism of teachers in the era of "Internet+" are proposed.

Dong WJ, Huang Y. (2019). From the aspects of curriculum, teaching, learning, environment, teacher development, evaluation, education management and organization, we discuss the challenges of changing the model of vocational education, such as returning to the essence of education and avoiding the disadvantages of technology, and propose the development goal of "adapting and leading artificial intelligence" to construct the path and model of changing vocational education.

Huang RH et al. (2020). Huang, R.W. et al. (2020). From the perspective of a super large-scale Internet education organization, the study discusses how to effectively implement online education from the perspective of seven elements: a smooth communication platform, appropriate digital resources, convenient learning tools, diverse learning methods, flexible teaching and learning organization, effective support services, and close collaboration between government, enterprises and schools, and provides ideas and methods for the participation and support of online teaching and learning by multiple parties such as relevant enterprises, families and society.

Wu Di et al. (2020). Strategies for coping with large-scale and long-cycle online teaching to enhance teachers' and students' information literacy are proposed in four aspects: building an online teaching support service system and paying attention to the development of online teaching in weak schools; conducting online teacher training and strengthening collaborative teaching and research; innovating online teaching modes and strengthening teacher-student interaction; and promoting home-school cooperation and jointly building an external support environment.

Education Management System

Zhang Jie. (2022). The reform of university education management system is proposed in four aspects: establishing the concept of lifelong education, introducing the credit bank system, giving full play to the advantages of "Internet+", and improving the

supervision mechanism of lifelong education system in universities, which is expected to provide some reference and reference for related personnel.

Fan Guorui. (2020). It is believed that under the perspective of multiple governance, the path of social organizations' participation in supervision and evaluation can be broadened by strengthening legislative construction, enhancing system supply, constructing certification standards, and regulating access procedures and evaluation mechanisms; meanwhile, the professional qualification and professional capacity of social organizations can be strengthened, and the governance mechanism of social organizations' participation in supervision and evaluation can be established and improved, so as to realize the effective docking between social organizations and supervision and evaluation.

Xue EY, Li, J. (2020). It is proposed to establish and improve the management system and operation mechanism of emergency education; the adjustment of education supply is urgent, reform the education supply structure with learning as the center, and reform the training system of emergency talents.

Sun Miantao, Li Sha. (2019). In the process of the formulation of education system reform policy, a more systematic theoretical design of education system reform policy is carried out, and the countermeasure ideas and measures of education system reform at all levels and types are proposed. In terms of realization logic, it reflects the logic that theory comes from practice, theory guides practice, and the symbiosis and co-development of diversified education system theories.

Zhou Chuan. (2019). It is considered that realizing the modernization of higher education governance system and governance capacity is the new vision of the reform of higher education management system in China, for which we should make a substantial reform breakthrough in higher education management system based on the deep change of national administrative system.

Li Yang. (2018). The analysis starts from the process of the change of higher education management mechanism in China, which is characterized by the lack of incentive mechanism, structural contradiction and quality weakness.

Yang Zunwei. (2018). The reform of higher education management system in China is expected to change the management function of government and build a new relationship between government, school and society; accelerate the construction of education legal system and implement the autonomy of higher education institutions; strengthen the cultivation of intermediary organizations and establish higher education governance system.

Li Liguo. (2018). It is believed that section hierarchy is an important institutional design and management operation rules in higher education organization and management, which on the one hand promotes the standardization, institutionalization and standardization of higher education management; on the other hand, it does have conflicts with the essential attributes of higher education organizations, especially section hierarchy may lead to bureaucratization and administrativeization. On the other hand, there are indeed conflicts with the nature of higher education organizations.

She Y, Shan DS. (2018). The achievements and shortcomings of China's education management system reform since 40 years of reform and opening up are analyzed, and it is proposed that we should continue to adhere to the priority development of education, vigorously promote education equity, comprehensively improve education quality, strengthen the construction of teachers, and deepen comprehensive reform in the field of education.

Shao Zebin. (2013). On the basis of adhering to the "county-based" management system, we must improve the incentive advantages of compulsory education supply, crack the incentive dilemma of compulsory education supply, and build a compulsory education governance mechanism with "decentralized management, perfect incentive mechanism, and sufficient funding".

Concept of Industry-education integration

Industry-education integration refers to a deep-rooted form of cooperation between industry and universities, through which both parties work together to achieve their respective development needs and strategic goals. Industry-education integration is

broader and more demanding than university-enterprise cooperation, and tends to promote basic and applied research and scientific and technological innovation through cooperation between enterprises, universities, research institutions, governments and financial institutions. The integration of industry and education focuses on the cultivation of applied talents and applied research, with a greater emphasis on the application of science and technology and production practices, with the aim of achieving a positive interaction between the education system and the industrial system, thereby realising the unity of education development, human development and economic and social development.

The integration of industry and education mainly explores the collaborative relationship between education and industry, which belongs to the problem domain of the relationship between education and economic and social development, and is an important element of macro-level research in education - the mutual influence of education and economy and its commissioning, as well as a key area of research in education economics. -the value of education to industry and its utilization. The idea of integration of industry and education has a long history, and it is related to the combination of education and production labor, school-enterprise cooperation, integration of industry-university-research, engineering integration, and the practicality of education, etc. Its downstream issues include "modern apprenticeship", "government-industry integration", "school-enterprise co-education", and "school-enterprise co-education", "The upstream issues are the purpose of education (transferring knowledge or training skills), the function of education (promoting human development or economic and social development), the relationship between education and economy (education first or simultaneous development), the attributes of education (whether education is an industry), and the economic value of education (whether education can promote industrial development).

Different scholars have different understandings about the influencing factors of industry-education integration. Through the review and analysis of relevant literature, the researcher found that the research content mainly has the following views:

Santoro & Chakrabarti. (2002). and Y. Austin Chang. (2006). found that the own conditions of vocational schools are the main factors influencing the integration of industry and education. The school's professional setting, faculty level, and implementation power affect the school's ability to capture and understand the information about the integration of industry and education, which in turn affects the motivation to implement the integration.

Siegel & Waldman. (2003). and Brodkey. (2005). argue that enterprises are the key factors influencing the integration of industry-education. The purpose of the enterprise affects the willingness and motivation of the enterprise to cooperate with the school. Generally, enterprises that aim at short-term profitability are not willing to cooperate, and if the school cooperates with such enterprises, it is likely to be detrimental to the development of students.

Cui Xu et al. (2010). pointed out that the issues of cooperation mechanism and system, willingness to cooperate, and benefit distribution are the main factors limiting cooperation from the perspective of industry-university-research cooperation model.

Harald Knudsen. (2015). argued that the integration of industry-education is affected by the joint influence of three factors: the school itself, enterprises and the government.

Liu Yourong et al. (2015). examined 14 factors, including awareness of industry-education integration, organizational coordination ability, organizational R&D ability, quality resources , visibility and authority, cultural coupling, institutional coupling, knowledge and technology coupling, communication channels, cooperation experience, reasonable benefit distribution, industry-education integration atmosphere, policy support, and market environment from three aspects: internal factors, coupling factors of both sides, and external environmental factors, among which from internal perspective of universities, organizational R&D capability, quality resources, visibility and authority have significant influence.

After conducting research hypothesis and data analysis, Tao Hong et al. (2017). proposed the strategy of university's integration of industry-education in five aspects:

guidance and coordination, financial investment, education concept, resource platform, and learning from experience.

Wang Baoyu. (2018). pointed out that the key factors affecting the deepening of the integration of industry and education are talents, technology, concept, system, project, funding, vision, institution, platform and information. The integration of industry-education is not only the integration between various subjects,but also the integration between various key factors.

Hong XB. (2019). found that educational concept, information symmetry, resource platform, technological capability, and faculty strength are the main influencing factors of the effectiveness of industry-education integration in application-oriented universities.

Sun Yunzhi. (2021). studied that the five elements that influence the integration of industry and education are industry, university, government, city and society. From the internal perspective of universities, management should be started from the system, and the system logic and statute are two key elements for the success of system implementation.

Zhu Kejin. (2021). found that the organizational innovation of university industry-education integration is the process of exploring the common demands and differences in the interaction between the two main bodies of "industry" and "education", so as to stimulate and rationalize the mechanism of collaborative cultivation of talents. Through organizational innovation, institutions related to the integration of industry and education adapt to the external institutional environment and internal cultural environment of universities, and institutional entrepreneurs respond to the challenges of environmental incompatibility and low returns to promote the institutionalization of organizational innovation.

According to Zhong Zhongshan. (2022), the factors influencing the integration of industry and education focus on five categories: participation dynamics, input, subject characteristics, mechanism, and external environment. The participation motivation of each subject directly affects the construction effectiveness of higher vocational industry-education integration collaborative education community; the personality characteristics

of each subject play a regulating role in the construction of higher vocational industry-education integration collaborative education community; the internal and external environment plays a supporting role in the construction of higher vocational industry-education integration collaborative education community.

Table 2.1 Literature on factors influencing the integration of industry and education in higher education

Factors influencing / Researcher	Teacher resources management	Interest power	management mechanism	Talent Development	science and technology	Financial Management	information symmetry	terrace	coordinate ability	environment
Zhou Bukun et al	√	√	√	√	√	√				
hong Xiao-bo	√			√			√	√		
Gong Pengjian	√			√	√	√			√	
Meng Qi				√		√			√	
Tang jie		√	√	√						
Cheng Hui	√									√
Tao Hong et al				√		√		√	√	
Liu Yourong et al			√	√	√	√	√		√	
Zhang Junzhen et al	√	√	√	√	√	√				
Wang baoyu	√		√	√	√	√	√	√		
Zhong Zhenshan et al		√	√			√				√
amount to	**6**	**4**	**6**	**9**	**5**	**8**	**3**	**3**	**4**	**2**

According to table 2.1, the researchers used standards to consider the corresponding characteristics as the framework for this study, by selecting features with a frequency of 6 or higher and summarizing them into 4 features, including: 1) teacher resources management, 2) financial management, 3) management mechanism, and 4) talent development.

Teacher resources management for industry-education integration

An Xuewu. (2023). We have explored the team building paths of relying on school-enterprise cooperation as the main principle, taking high-quality education as the common vision goal, forming a structured "double-teacher" quality teacher team by relying on the joint project, building a school-enterprise cooperation platform to support team development, improving the operation system to guarantee the quality of team building, and improving the project performance management and assessment mechanism to enhance the quality of team development. The effective path of team building.

Cao Y, Meng QG. (2023). Five important measures for the construction of high-quality "dual-teacher" vocational education teachers are proposed. These are: accelerating the implementation of "dual-teacher" teacher recognition standards, implementing the vocational school teacher education upgrading plan, promoting the integrated training of vocational teachers, strengthening the construction of "dual-teacher" teacher training system, and strengthening the construction of part-time teachers.

Ding Chen, Liu Dayu. (2023). It is proposed that the improvement of teaching ability of teachers in higher vocational colleges should start from strengthening teachers' adaptability to improve teaching, strengthening the guarantee of higher vocational colleges to improve teaching ability, strengthening the service output of enterprises to teachers in higher vocational colleges, and enhancing the evaluation effect of teaching ability.

Liu L, Zhou JH. (2022). It is considered that the overall improvement of the construction level of teaching innovation team of vocational education teachers can be achieved by optimizing the two-way flow mechanism of school-enterprise personnel to strengthen the practice community, enhancing the professional collaboration synergy of

team members to build a professional community, and expanding the space of school-enterprise collaborative education to build a community of interests.

Hao TC. (2021). It is found that the factors affecting the dilemma of implementing enterprise practice policy for teachers in higher education institutions can be attributed to three aspects: difficulties in integrating enterprise identity, obvious school-enterprise role conflict and poor quality of enterprise practice. It is suggested to enrich the enterprise work experience of vocational education teachers in the pre-service stage, establish a regular mechanism for teachers' enterprise practice, and actively cultivate teachers' awareness of professional development.

Guo Guangjun, Zhu Zhongyi. (2020). It was found that the current teacher resources management of industry-education integration in higher vocational education has problems such as imperfect system design, insufficient teacher capacity and investment, insufficient financial investment, and imperfect base condition construction. Five suggestions are put forward: First, the construction of competence system including education and teaching ability, scientific research ability, social service ability, cultural inheritance and innovation ability, and international exchange and cooperation ability; second, the construction of structured, industrialized and socialized level of talent system is improved; third, the system system of teacher training and training, education and teaching reform, and scientific research service is improved; fourth, the system of performance pay, title evaluation, science and technology service The incentive system; five is to strengthen the conditions, funding, supervision and protection system construction.

Zhou Yurong, Zhang Anfu, Li Zhifeng. (2020). It is suggested that it is necessary to innovate the concept of engineering education, build a "win-win" practical education platform of school-enterprise cooperation, cultivate the core competence of teachers in engineering education, and establish a teacher evaluation system that meets the characteristics of engineering education.

Chen Baohua. (2019). Through empirical analysis and research, it is shown that practical ability, practical teaching skills, applied research ability and self-development

have a positive effect on the development of teachers' teaching ability. The teaching competency development of teachers in private undergraduate universities under the environment of industry-education integration should focus on three aspects of cultivating teachers' practical ability, applied research ability, and practical teaching skills.

Wang Nos, Peng XuMei, Xu Han. (2019). By sorting out the professional roles, quantity scale and quality structure of part-time teachers in China's universities, four aspects such as institutional innovation, organizational guarantee, incentive mechanism and university-enterprise cooperation are pointed out as important ways to improve the teaching ability of part-time teachers in universities.

Jiang Aihua et al. (2019). Proposed to establish the conceptual model of teachers' cross-border development from four dimensions of knowledge, organization, space-time and thinking; focused on the construction of excellent teachers' team under the perspective of cross-border talent cultivation, and constructed the working mechanism of teachers' cross-border development from four aspects of party committee unification, university and college linkage, win-win cooperation and goal orientation; elaborated five basic paths of teachers' cross-border development: reshaping the work of teachers' cross-border development based on the cultivation of new engineering talents A new concept of teacher development based on the cultivation of new engineering talents, a new system of teacher development and training based on the whole life cycle, a new structure of teacher training courses highlighting the quality improvement of teachers' core competencies, a new platform of collaborative education between schools and enterprises for the deep integration of industry and education, and a new mechanism of teaching evaluation and incentive for the construction of first-class undergraduate education.

Han Yuhui, Zhang Qingling. (2018). Exploring the ways of "dual tutor" team construction by establishing a leading group for "dual tutor" construction, establishing a system for "dual tutor" selection and recruitment, building a resource base of enterprise masters, and establishing a "dual tutor" training platform of "double room and one station".

Yan ZL, Li XY, Tai MH. (2018). Based on the inverse relationship between resistance factors and motivation mechanism, the motivation mechanism of higher vocational teachers' enterprise practice is constructed, including policy system guarantee mechanism, practice effect evaluation mechanism, school-enterprise cooperation deepening mechanism, and teachers' practice incentive mechanism.

Fan Qian, Qiu Hui. (2018). They believe that local universities should improve the recruitment and admission system, strengthen the system of further training for teachers, establish a system of teacher transfer and re-training, and implement a diversified evaluation system.

Xu ShaoMing. (2016). It is believed that the lack of dual-teacher teachers, imperfect education evaluation system, lack of cooperation platform and some other problems have seriously delayed the development of China's application-oriented universities. Therefore, it is suggested to strengthen the construction of dual-teacher teachers, improve the mechanism of talent introduction and internal training, and establish a scientific evaluation system, so as to actively build a teacher team suitable for the development of application-oriented universities.

Liu Rongxiu. (2016). pointed out that the integration of industry and education provides a platform for the development of teachers' team and also puts forward requirements for teachers' configuration. It is suggested to adopt various paths such as introducing talents, reforming the appointment system and implementing teacher preparation to provide personnel guarantee for the development of integration of industry and education.

According to Cheng Hui. (2017), the lack of practical experience of some university teachers can lead to the weakening of the effect of integration of industry and education. There is a need to help teachers improve their practical and educational abilities that are closely integrated with industry.

Wang Baoyu. (2018). pointed out that talents are the core factor of the development of the integration of industry and education, including university experts, enterprise experts, students, skilled workers, and technical experts from government,

industry, and intermediaries who promote the development of the integration of industry and education. Without talents, there will be no high-tech, no high-tech research, development, application and promotion.

Wang Di. (2020). pointed out that to accelerate the innovative development of vocational education industry-teaching integration, it is necessary to build a high-quality "dual-teacher" teacher team, and cultivating "dual-teacher" teachers has become an inevitable trend to deepen the integration of industry-teaching. The study also proposed to implement the construction of a "dual-teacher" teacher construction platform, establish a sound "dual-teacher" teacher incentive mechanism, enrich the internal and external forms of cooperation for "dual-teacher" teacher training, and promote the development of "dual-teacher" teachers by formulating a "dual-teacher" teacher construction plan and improving the "dual-teacher" teacher evaluation system.

Xie Changfa. (2020). found that the reasonable two-way flow of school-enterprise personnel builds a bridge for school-enterprise cooperation and industry-teaching integration that is interoperable, mutually supportive, and mutually beneficial. The support of national policies can strongly promote the two-way flow of school-enterprise personnel; the personal development of school-enterprise personnel has an uncertain influence on the two-way flow of school-enterprise personnel; the restriction of enterprise interests and shallow school-enterprise cooperation are the key factors that hinder the flow of school-enterprise personnel.

According to Zhou Bukun et al. (2021), personnel integration should be used as a bridge, with school teachers and enterprise technicians working part-time in both directions, conducting joint talent development and scientific and technological research and development, etc. on the same platform, cooperating to develop talent development or employee training plans, and providing mutual services for student internship and practical training, teacher practice, student employment and entrepreneurship, and employee training.

To sum up, Teacher resource management refers to the management of the school's teaching force through management activities such as planning, organising, leading

and controlling, with the aim of improving the quality of teaching, enhancing the quality of teachers and improving teaching effectiveness. It contains: staffing, performance assessment, talent selection, position promotion, teacher evaluation system and other personnel organisation contents; teacher ethics education, teacher behaviour, teacher professional conduct, sense of responsibility and mission and other teacher ethics construction contents; teacher recruitment, study seminars, talent selection, title assessment, career planning and other teacher development aspects. The teacher resource management model is related to the achievement of the university's development goals and talent training objectives. Under the concept of industry-education integration, "dual-teacher teachers" and "teacher evaluation and growth system" have received widespread attention from scholars.

Financial management for industry-education integration

Ran Yunfang, Lu Yingqi, Zhang Rui. (2022). Based on the survey data of the Department for Business, Innovation and Skills, we analyzed the cost-benefit components of the participation of British enterprises in modern apprenticeship and found that: the short-term cost of productive industries is greater than that of service industries; the payback period of productive industries is longer than that of service industries; the cost-sharing ratio of employers gradually increases and the cost-sharing ratio of the government gradually decreases as the age of apprentices grows. Accordingly, we propose the following suggestions for the modern apprenticeship system in China: diversify the financial investment to reduce the cost expenditure of enterprises; adopt special subsidies to encourage lifelong learning of apprentices; improve the cooperation mechanism to balance the participation status of schools and enterprises.

Xie Xiaozhen, Liu Peihui. (2022). The mechanism of science and technology finance to promote the integration of industry and education is explored, and the interaction mechanism between "education/technology-finance-industry" is designed, and the mechanism and path of science and technology finance to promote the integration of industry and education is analyzed with MIT as an example, and the successful model of MIT is further explored. The successful model of MIT is a reference and inspiration for

China's science and technology finance to promote the innovation of industry-education integration, and the path of China's science and technology finance to promote the innovation of industry-education integration is proposed accordingly.

Ma Xinyue, Tang Ni, Shi Weiping. (2021). Among the 56 institutions in the "double-high program", 37 institutions have different degrees of input redundancy and output shortage. The input indicators of the institutions in the "double-high plan" show a negative correlation with the efficiency of school operation, and the most influential indicator is capital equipment; the output indicators show a positive correlation with the efficiency of school operation, and the most influential indicator is the results of school-enterprise cooperation. The evaluation index system of "double-high plan" institutions should be constructed based on classification, and the governance system and mechanism of "double-high plan" institutions should be reformed based on resource allocation efficiency.

Yang Guangjun, Zhou Fenghua. (2020). Suggestions for the construction of industry-education integrated enterprises in China, first, the need to classify the policy by place; second, increase the attention to small and medium-sized enterprises; third, scientific and reasonable measurement of enterprises in the process of participation in vocational education resources input; fourth, accelerate the implementation of the combination of incentives to refine the policy.

Li BZ et al. (2020). It is found that the choice of knowledge-embedded resource allocation strategy is closely related to the behavioral strategies of both schools and enterprises; enterprises and universities have self-organized characteristics in resource allocation choice; both schools and enterprises get benefits, and the increase of government rewards for universities and additional benefits for enterprises have a facilitating effect on the choice of knowledge-embedded resource allocation, and the increase of related resource consumption has a There is an inverted U-shaped relationship between the co-benefit distribution ratio and the choice of knowledge-embedded resource allocation.

Wu Jinling. (2020). The cost composition and influencing factors of enterprises' participation in school-enterprise cooperation in vocational education are analyzed, and the construction of compensation mechanism is proposed from multiple perspectives of government, industry, enterprises and schools to promote the long-term development of school-enterprise cooperation.

Wang Guibin. (2019). Drawing on the experience of Dutch vocational education and training system, it is proposed to build a cultural statute commonly recognized by vocational education stakeholders in China; secondly, to establish an intermediary service organization for vocational education school-enterprise cooperation; finally, to attach importance to vocational education funding and establish a diversified funding mechanism.

Zhang Tingting. (2019). It is proposed that the existence of problems such as insufficient policy support, inadequate financial investment and unsound laws and regulations make it always difficult to deepen school-enterprise cooperation in higher vocational universities. In order to deepen school-enterprise cooperation in higher education institutions, the government needs to improve the policy guarantee mechanism, establish the financial guarantee mechanism and construct the legal guarantee mechanism.

Chen F, Xu M, Wang, H. (2018). It is believed that university-enterprise R&D cooperation positively affects the scientific research output of universities, and the joint application of invention patents by universities and enterprises has a stronger positive effect on the scientific research output of universities than the transformation of scientific and technological achievements; the input of scientific researchers plays a partly mediating role in university-enterprise R&D cooperation, and the input of scientific research funds plays a fully mediating role in university-enterprise R&D cooperation. Therefore, universities should actively carry out various forms of R&D cooperation with enterprises in the context of national innovation drive to promote the circulation and sharing of innovation resources and realize the high output of university scientific research.

Zhou Shaomei. (2018). It is proposed that the legislative establishment should be strengthened to promote the legalization of the integration of industry and education in vocational education; strengthen the top-level system design of the integration of industry and education to play the role of government promotion; seek common interests to stimulate the enthusiasm of enterprises to participate in the integration of industry and education in vocational education; enhance the guidance capacity of industry to play its coordinating role in the integration of industry and education in vocational education; build a diversified financial input mechanism to provide sufficient financial support for the integration of industry and education The construction of a collaborative platform among government, school, industry and enterprises to create a mutually beneficial and win-win ecosphere for the integration of industry and education.

Xu Feng, Li Jin. (2017). It is proposed to develop a long-term mechanism for enterprises to deeply involve in professional education, and to establish a multi-dimensional compensation mechanism for enterprises to participate in the cost of school-enterprise cooperation in higher vocational colleges from government policy support, industry service guidance, technical feedbacks from colleges and employment feedbacks for talents.

Wu Ying, Li Kuankuan. (2017). It is believed that the cooperation thresholds under different cooperation modes are not the same, but the leader holds the advantage are the basic conditions for cooperation contractualization; the positive incentive effects of marginal knowledge output, knowledge matching perception degree and knowledge transformation ability have stronger effects on followers than on leaders; high knowledge spillover makes the spillover cost increase and makes both parties enter into input dilemma, which can be framed by ensuring the core knowledge input of both parties into a fixed proportion The responsibilities and obligations of both parties can be framed by ensuring a fixed ratio of core knowledge input, which is conducive to the responsibility and risk avoidance of both parties and ultimately promotes the cooperation.

Pan Nianping. (2017). Based on the perspective of stakeholders in vocational education grouping, it is proposed to construct the interest adjustment mechanism of

multiple subjects in grouping, and it is suggested that the financial special funds invested by the central public finance should be the main one, and the incentive mechanism of enterprise input and compensation mechanism of profit and loss should be established to realize the shared responsibility and resource sharing of school grouping, so as to ensure that vocational education can truly realize grouping.

Ren Yunliang. (2016). By combining the school's practice, risk identification in management awareness, management system, management system, procurement and equipment renewal links different from enterprises, performance evaluation, etc., measures are proposed to raise awareness, enhance cooperation, solidify contracts, clarify property rights; improve management mechanisms to prevent management risks; break through important links, avoid potential risks; evaluate performance, reasonable compensation, and avoid the occurrence of interest risks to prevent the occurrence of risk.

In the study of Tao Hong et al. (2017), the difference in financial investment and the gap in the effectiveness of integration of education and industry between universities in the Pearl River Delta region and the northwest of Guangdong Province in China were compared. It was proposed that the financial investment in universities in the backward region should be increased and special funds for integration of education and industry should be established to support the development of integration of education and industry in universities.

Wang Yingbo. (2017). proposed the construction of regional public practical training center as an innovative initiative, and he explored the construction standards and functional positioning of public practical training center with diversified investment and integration of production and education, the management system mechanism of public practical training center with market-oriented operation, and the production realization design of public practical training center with enterprise management, which opened up a new path for exploring the construction mode of regional public practical training base .

Wang Baoyu. (2018). pointed out that financial input is the basic factor to ensure the smooth implementation of the integration of industry and education, including

government funds, enterprise funds, university funds and social funds. Insufficient funding is one of the important reasons for the slow development of the integration of education in China at present.

Zhou Bukun et al. (2021) argued that resource integration should be guaranteed to promote the integration of resources between schools and enterprises, which is conducive to the integration of education chain, industry chain and innovation chain to form a relatively complete and complete technological innovation and talent development system, and to achieve mutual benefits for both sides through cooperation, common construction and sharing.

Zhang Ying et al. (2021). proposed that universities are the main position to cultivate high-quality technical and skilled talents, and increasing investment is the endogenous driving force to achieve its rapid development, and the path of social capital investment should be constructed with a view to providing support for improving the quality of education and teaching in universities and promoting the construction of integration of education and industry.

According to Zhong Zhongshan et al. (2022), the policy environment affects the implementation effect of the integration of industry and education and collaborative education community, which is manifested in policy construction, financial investment and taxation policy. Among them, financial investment has a direct impact on the construction effectiveness of the integration of industry-education.

To sum up, financial management is the process of raising, allocating, using and monitoring funds in a rational manner to achieve financial objectives and to ensure the long-term development and stable operation of an enterprise or organisation in the course of its operation. Financial management includes financial decision-making, financial control, financial analysis and other aspects. Its main objective is to achieve effective management and use of funds in order to maximise the return on corporate wealth value and profit. The financial management of the industry-education integration includes the source of funds, funding input, planning and budgeting, resource allocation, financial supervision and risk management, etc. It also involves the allocation of inputs and interests

between universities and enterprises. In the context of the industry-education integration, "diversified input methods" and "distribution of university-enterprise rights and interests" have received attention from academics.

Management mechanism for industry-education integration

Deng SH, Wang H. (2022). The three basic functions of modern industrial colleges are co-education based on factor integration, joint innovation based on knowledge value-added, and benefit symbiosis based on value creation. It is proposed to establish and improve the operation mechanism including development motivation mechanism, information sharing mechanism, cooperation and trust mechanism and benefit distribution mechanism, and promote the effective linkage among them.

Chi Chunyang. (2021). Based on the stakeholder theory, we analyze the multi-dimensional demands of the stakeholders of the integration of higher education industry and education from three attributes of legitimacy, power and urgency, and propose to build a sustainable endogenous power mechanism, a pluralistic core operation mechanism and a reasonable and effective evaluation mechanism to realize the full participation of the integration of higher education industry and education and promote the value realization and harmonious win-win situation of each stakeholder.

Yang Me, Wang Ying, Zhou Zhengzhu. (2021). In order to break through the bottleneck of the development of the integration of industry and education and promote the deep integration of industry and education in applied undergraduate institutions, we should establish the concept of "big platform" and promote the construction of the platform in a hierarchical and phased manner; explore the new mode of organization system through institutional design; improve the management mechanism so that the second-level colleges can become the main body of the construction of the platform of integration of industry and education; establish a sound system and strengthen the guiding role of assessment and incentive on the construction of the platform of integration of industry and education. Liu Jingjing.

Liu Jingjing. (2021). It is believed that to further promote the practical process of modern apprenticeship, it is necessary to clarify the structure, form, knowledge and

technology in the process of industrial development, to clarify the fundamental requirements of industry on the layout of modern apprenticeship majors, implementation subjects, teacher teams and development orientation, and to build up the integration mechanism of modern apprenticeship and industrial development from the dimensions of interest-driven, coordinated cooperation, dual-teacher teaching and mutual recognition of qualifications, in order to In this paper, we present a study on the integration mechanism of modern apprenticeship system and industrial development in order to better realize the integration development of education and industry.

Cheng Baozhi, Xu Quan, Zhang Guofa. (2021). Taking ZTE Information College of Daqing Normal College as an example, the study illustrates the paths, strategies, practices and effectiveness of local undergraduate institutions in cultivating technically skilled applied talents to meet the needs of the society by relying on the new form of training applied talents, such as industry colleges, top-level design and conceptual updating, and active integration with the needs of industries and industries, in order to provide a better opportunity for local undergraduate institutions to meet the needs of regional economic development. The aim is to provide reference for the construction of industrial colleges and innovation of talent cultivation mechanism in local undergraduate institutions under transformation development.

Gu Guangfu, Zou Jiquan. (2020). Based on the analysis of the connotation of the deep integration of industry and education in higher vocational education under the construction of "double-high plan", the problems of the integration of industry and education in vocational education are sorted out, and it is proposed that the deep integration of industry and education in higher vocational education under the background of "double-high plan" requires the government to introduce relevant policies to build the integration of industry and education, to build the management mechanism of "government, industry, enterprise and school", to build the management mode of "double-body" education of school and enterprise, to build the coordinated development demand of professional chain and industrial chain, and to build a college of higher vocational

education. To build a high-level development platform for the integration of industry and education in higher vocational education.

Zhang J. (2020). The "special enterprise integration" school-enterprise cooperation mode is conducive to the formation of school-enterprise collaborative education mechanism and the promotion of school-enterprise in-depth cooperation; it is conducive to the precise matching of majors with industrial needs and the deepening of industry-education integration. Specialized enterprise integration" generally exists in the form of three-level colleges, and the second-level colleges are responsible for the construction and operation management of the third-level colleges as the responsible department. In the operation of the "special enterprise integration" school-enterprise cooperation mode, a school affairs committee should be established, rules and regulations for school-enterprise cooperation should be set up, and both schools and enterprises should participate in the whole process of talent development.

Wang Xuhui, Li Jing. (2020). It is proposed that the endogenous impetus of the first-class academic clusters to lead the deep integration of industry-education should be enhanced from the aspects of cooperation mechanism, formation mode, institutional structure and resource allocation, and the practical leading role of the first-class academic clusters to the deep integration of industry-education should be realized from the aspects of supply and demand matching, policy supply, intermediate organization and coordination, and establishment of service platform for integration of industry-education.

Qian Wei et al. (2020). The "1234" practice mechanism of "1+N" open school-enterprise cooperation of "Industrial Technology College" of Shanghai University of Technology is introduced, which aims at improving students' engineering practice and innovation ability, with the school and enterprises as the main body, the three elements of ideological leadership, teachers' teaching and scientific research enhancement, and the four hands of students' internship, enterprise tutor teaching, graduation design and students' participation in enterprise project development. Through the cooperation of university and enterprises to build a field teaching platform, an engineering ability training platform and an engineering technology development platform, we promote the

integration of industry and education and form a collaborative education model with perfect organization structure and distinct teaching characteristics, which can improve the quality of engineering education in local universities of applied research.

Xie Xiaozhen. (2019). From the perspective of system theory and holistic theory, using multidisciplinary theories, we propose to design the mechanism of "integration of industry and education" from three levels: macro level, the design of integration mechanism between national industrial system and higher education system; meso level, the design of integration mechanism between regional industrial clusters and regional academic clusters; micro level, the design of higher education mechanism of "integration of industry and education" integrated innovation." The mechanism design of "industry-education integration" should consider how to achieve effective resource allocation, maximize the effectiveness and efficiency of resource use, obtain available information at the lowest possible information cost for all parties, use available information resources most reasonably and effectively, and take into account and realize the rights and interests of stakeholders as much as possible.

Cai Jingmin, Xia Li, Yu Guojiang. (2019). It is considered that the integration of industry and education is an important grasp to improve the quality of applied talents training and regional economic and social innovation development, and it is also a necessary way to build a high-level application-oriented universities. Only based on the reasonable cognition of the connotation of the integration of industry and education in application-oriented universities and strengthening the innovation of the mechanism of the integration of industry and education in application-oriented universities can we continuously and deeply promote the integration of industry and education.

Lei Zhengguang. (2019). It is considered that it is of great value and significance to promote the integration of industry-education and quality improvement of vocational education by establishing the third-party evaluation mechanism of vocational education and regulating the third-party evaluation process in terms of system supply mechanism, screening and elimination mechanism, standard optimization mechanism, information

transmission mechanism, supervision and management mechanism and feedback and early warning mechanism.

Huang Lin, Sui Guohui, Wang Rong. (2019). It is proposed that to establish a talent development supply system that is compatible with the needs of regional economic development, it is not only necessary to break the inertia thinking of traditional undergraduate college talent development, but also to break the bottleneck that restricts the development of integration of industry and education through the reform of institutional mechanism. Through two levels of government and universities, the reform idea of integration of industry and education is proposed to provide reference for the implementation of integration of industry and education and the solution of the problem of "two skins" of talent cultivation supply and demand.

Xu Chang, Xie Xudong. (2018). It is proposed that around the development direction of industry-education integration in vocational education, the key to build a collaborative education mechanism of government, school, enterprise and industry is to build a mutually beneficial demand-driven mechanism, a shared and common prosperous resource allocation mechanism, a standardized and effective dynamic coordination mechanism, a scientific and reasonable performance evaluation mechanism, and a collaborative mechanism with the deep participation of industry organizations.

According to Chen Weixia. (2017), the integration of industry and education in application-oriented universities can be effectively promoted by establishing a four-loop management mechanism of "government-led, industry-directed, enterprise participation, and school-driven", collaboratively building practical teaching platforms, collaboratively building curriculum systems, collaboratively building faculty teams, and reforming teaching methods and evaluation mechanisms. Integration and cultivation of applied talents.

Wen Zhenhua. (2018). points out that the long-term cooperation mechanism is the basis of the integration of industry and education, and the operation and management mechanism is its core. Through the "six common" practice model based on the "hybrid

system" of double-body schooling, the problem of the lack of long-term mechanism of school-enterprise cooperation can be effectively solved.

Rao Lijuan. (2018). found that the operational mechanism of the integration of industry-university-research directly affects the scientific operation and sustainable development of higher education elements and their internal and external relationships. A breakthrough in four aspects was proposed, including establishing a long-term win-win cooperation mechanism, improving the adjustment mechanism of inputs and benefits, establishing a two-way teaching management mechanism, and improving the result-oriented incentive evaluation mechanism.

Tang J. (2018). believes that in the integration of local universities, the interests of different interest subjects should be accurately grasped, a scientific and reasonable investment, supply, evaluation and cooperation mechanism should be established, the rights, obligations and responsibilities of enterprises, local universities, local government and students in the integration of education and university-enterprise cooperation should be clarified, and the scientific, standardized and reasonable integration of education and industry in local universities should be improved, so that each interest subject can get corresponding benefits.

Chen Weixia et al. (2021). discussed the reform of the long-term management mechanism of school-local interaction based on the integration of industry and education from the aspects of the existing problems, the construction of the long-term management mechanism and the significance of the construction of the long-term management mechanism, and proposed the concept of the long-term management mechanism of school-local interaction based on the integration of industry and education.

Zhou Bukun et al. (2021). argued that institutional integration should be supported by mutual learning from both schools and enterprises, effectively combining modern enterprise system with modern university management system, establishing institutional mechanisms for school-enterprise co-construction and sharing, and both sides collaborating to establish decision-making, management and operation systems of industrial colleges such as councils, advisory groups, industrial alliances, professional

committees and various working groups, and effectively implementing and evaluating them.

To sum up, Management mechanism refers to the process of establishing a set of management system framework within an organisation by developing various types of management regulations, processes and standards, and relying on the organisational structure to advance work, ensure management efficiency, quality, accuracy and stability, and achieve organisational goals. The mechanism can include various management systems, such as financial management, human resource management, teaching management, risk management, knowledge management, etc., which can be improved and adjusted according to the needs and characteristics of different organisations. It can be a motivation mechanism, operation mechanism, evaluation mechanism, sharing mechanism, cooperation and trust mechanism, benefit distribution mechanism, etc. Each mechanism should have a clear division of responsibilities, clear role requirements, defined workflow and process control, effective monitoring and tracking, scientific performance allocation and incentive mechanism, and corresponding evaluation and improvement mechanism. Through effective management mechanisms, organisations can improve the transparency, science and effectiveness of their management, stimulate the initiative and motivation of their staff, and improve operational efficiency and economic effectiveness, thereby gaining a better competitive advantage and sustainable development.

Talent development for industry-education integration

Hu QH, Wang GW, Wang X. (2022). Focusing on the development of new generation artificial intelligence, based on the new strategy of national talents, combining the current situation and demand of artificial intelligence talents, exploring the effective way of "artificial intelligence+" composite talents cultivation with deep integration of school-enterprise cooperation for the outstanding problems of school-enterprise cooperation, which has a certain reference value for "artificial intelligence+" composite talents cultivation. It has a certain reference value for "AI+" composite talent cultivation.

Yang Xinbin. (2022). It is proposed that the university can focus on the high-end field of industry and industry, cultivate technical talents with strong professional ability, innovation ability, methodological ability, organizational leadership ability, sustainable development ability and comprehensive professionalism, which is equivalent to the level of "technical engineer", build a curriculum system of "technology traction, product carrier, science and reality integration, ability-based", and implement a trimester system with comprehensive practical courses. The deep integration of industry and education, the in-depth promotion of teachers, teaching materials, teaching methods of the "three teaching" reform as the entry point and breakthrough to deepen the internal construction, improve the quality of teaching, promote the formation of a high-level talent development system, and promote high-quality development of education.

Li Shihui, Chen Zhijun, Wang Bo. (2021). In response to the problems of independent associations, courses, competitions and scientific research in traditional teaching, and the lack of deep integration between industry and education, the innovative system of training highly skilled talents is proposed, which is "deep integration between industry and education, and synergy between group courses, competitions and research". Through the "Three One Project", the system is to effectively integrate industry and education, and to build a collaborative education mechanism of society, curriculum, competition and scientific research with the two-way skills workshop as the platform, so as to provide a reference for the cultivation of innovative high-skilled talents.

Feng C et al. (2021). In view of the problems faced by intelligent manufacturing talents cultivation in the background of new engineering, the reform path of intelligent manufacturing talents cultivation in local universities is explored: to optimize the intelligent manufacturing talents cultivation system by facing the industrial development needs and taking the results output as the guide; to build a new intelligent manufacturing talents cultivation mode by deeply promoting the integration of industry and education; to build a sustainable development of school-enterprise cooperation with the core of two-way communication between college teachers and enterprise talents. The system

has been proved to be more effective than other systems. The system has been proved to improve the training quality of regional intelligent manufacturing technical talents.

Yang G, Zhu W, Lu W. (2021). It is proposed to build a school-enterprise cooperation platform for regional industrial colleges, to closely match the training process of high-skilled talents with regional industries, to deepen the integration of industry and education, to build a training model of high-skilled talents that "sets up majors in line with industries, sets standards in line with jobs, constructs curriculum in line with tasks, and implements teaching in line with evaluation", and to promote the dynamic adjustment and optimization of the training model through the index of integration of industry and education, so that the training of talents can follow the social and economic development and cultivate high-quality and high-skilled talents for industrial development. The training mode is dynamically adjusted and optimized through the industry-education integration index, so that the talent development can follow the socio-economic development and cultivate the high-quality and high-skilled talents for industrial development.

Zou Yuxiang. (2021). Based on this, we take the integration of industry and education and school-enterprise cooperation as the entry point, coupled with the talent development objectives, specifications and talent development quality assessment mechanism of vocational universities, take the reform of curriculum system and teaching content as the starting point, based on the competence-based theory and the theory of vocational competence development stage, take the government chain, vocational college chain and enterprise chain as the outer helix, and take the knowledge and skills training as the outer helix. Based on the reform of the curriculum system and teaching content, and based on the competency-based theory and the stage of vocational ability development theory, we build the practical innovation platform of school-enterprise cooperation with the government chain, vocational college chain and enterprise chain as the external spiral and the knowledge chain, skill chain and quality chain as the internal spiral, and establish the double spiral talent development mode to promote the innovation of the talent development mode of vocational universities.

Zhou Bukun, Geng Ying. (2020). It is proposed that building an innovative and entrepreneurial curriculum system with organic integration with professional education and deconstructing and reconstructing the existing curriculum system according to the OBE concept are the core tasks of the cultivation of applied talents at present. The construction mechanism of the innovation and entrepreneurship curriculum system and the construction path of the applied curriculum system are systematically elaborated, and an effective, replicable and applicable talent development model with industry characteristics is constructed.

Zhu Xiaojun. (2020). The typical models of integration of industry-education in American community colleges are studied, and the characteristics and experiences of various models are comparatively analyzed to provide reference significance for the integration of industry-education in China's application-oriented universities. Finally, suggestions are put forward to promote the in-depth development of the integration of industry and education in China's application-oriented universities by injecting market-oriented thinking, strengthening the purchase of services, creating a systematic mechanism, and developing a school-enterprise collaboration model led by project clusters.

Cheng Baozhi et al. (2021). Exploring and studying the path, strategy, practice and effectiveness of cultivating technically skilled applied talents to meet the needs of society, with a view to providing reference for the construction of industrial colleges and innovation of talent cultivation mechanism in local undergraduate institutions under transformation development.

Tong Yuerong et al. (2020). explored a multiform, all-round, systematic and in-depth cooperation, building a joint talent center and a multi-level innovation platform with new technologies as the traction, building a hierarchical and progressive curriculum system and a diversified teaching mode, using competition as a practical part of the curriculum, setting up big creative school-enterprise projects and industry-university-research projects, and forming a form of training that combines classroom competition, industry-university-research, and building a shared teaching base.

Sheng Xiaojuan, Li Liwei. (2019). Based on the positioning of the integration of specialization and innovation and the integration of industry and education, we systematically design the curriculum system of "six stages and four dimensions" in the integration of specialization and innovation; build a trinity of "dual-innovation competition + professional practice + professional association" as the training carrier of innovation and entrepreneurship; and explore the path of integration of specialization and innovation of "teaching, competition and research as one, science, education and innovation through". He proposed to build a new system of training innovative talents based on the integration of specialization and innovation, and the integration of industry and education.

Ren Zengyuan, Liu Junnan. (2019). It is considered that in the field of higher education, artificial intelligence has influenced college talent cultivation in many aspects, put forward new requirements for college talent cultivation specifications, promoted the transformation and upgrading of college environment, reshaped the meaning of college teaching, prompted the transformation of college teachers' roles, etc. Therefore, universities must actively respond to the opportunities and challenges in the era of artificial intelligence, build a talent development platform with the integration of industry and education, adjust the curriculum and professional settings, and guide teachers to make reasonable use of artificial intelligence.

Shi Xiaoqiu, Xu Yingying. (2019). Starting from the systemic nature of talent cultivation, the construction idea of talent cultivation system driven by engineering education accreditation and industry-education integration is proposed, and the implementation case of network engineering major of Wenzhou University is given, which provides ideas and reference for the cultivation of talents in engineering education majors in local institutions and has reference value for the construction of new engineering majors.

To sum up, Talent development refers to the comprehensive, systematic, professional and practical training of talents under a specific education and training system to equip them with comprehensive qualities such as knowledge, skills, abilities and literacy that meet the needs of a specific job, occupation or society to meet the needs of socio-

economic development. Talent development can include various forms and stages of learning, such as school and university education, vocational training, internships, postgraduate studies, professional skills certification, etc. Talent development is influenced by educational philosophy, professional orientation, curriculum system, teaching management, teacher competence, practical conditions, teaching resources, school-enterprise cooperation and platform construction. At present, education concepts such as "integration of specialisation and innovation, and integration of industry - education" have attracted the attention of many education researchers. However, different fields and universities have different educational philosophies and training objectives. In general, the purpose of talent training is to meet the needs of enterprises or organisations for talent and to promote their sustainable development and progress, as well as to cultivate the various types of talents needed for the development of the country in various fields.

Context of Application-oriented University

An application-oriented universities is a university whose orientation is mainly application-oriented and whose goal is to cultivate senior application-oriented talents who can meet the needs of production, construction, management and service. In China, Gong Zhenwei first proposed the concept of "application-oriented university" in 1998. According to the international education standard classification and the actual situation of Chinese higher education, Chinese universities can be divided into three basic types: academic universities, applied undergraduate universities and vocational and technical universities or multidisciplinary or single-disciplinary institutions. The three types of universities correspond to the different talent cultivation objectives of "academic talents", "applied talents" and "skilled talents" (Pan Maoyuan and Dong Liping, 2009).

In 2015, China's Ministry of Education, National Development and Reform Commission, and Ministry of Finance jointly issued the Guidance on Guiding Some Local Undergraduate Universities to Transform into Application-oriented, which addresses the structural contradictions of Chinese higher education, the serious tendency of

homogenization, the difficulty and low quality of graduates' employment, and the weak ability of local universities to serve regional economic and social development, and the document proposes to guide some local The document puts forward the goal of guiding some local general undergraduate universities to transform into application-oriented universities, which makes the construction of university classification system take a key step. Subsequently, "cultivating application-oriented talents and building application-oriented universities" has become the orientation that new undergraduate universities, local undergraduate universities and private undergraduate universities, which occupy an important position in China's higher education, are competing for.

Although application-oriented universities have received the attention of China's Ministry of Education, they still suffer from the dilemma of academic value and the practical dilemma of integrating industry and education. On the one hand, application-oriented universities have been produced for a relatively short time, the theoretical system is still not perfect, and there is still a big gap between them and traditional academic universities in terms of academic research and academic value. On the other hand, the following problems generally exist in the integration of industry and education in application-oriented universities: 1) the talent cultivation mode has not changed fundamentally; 2) the driving force of university change is insufficient; 3) the driving force of enterprise participation in university education is insufficient; 4) the practical application ability of dual-teacher faculty is insufficient; 5) it is difficult to form an effective team between university and enterprise; 6) the mechanism of collaborative education is missing; 7) the cooperation mode between university and enterprise is single, and the integration of industry and education is only formal (Huang Lin, Sui Guohui, Wang Rong. 2019). The above problems are especially prominent in Guangxi, which is located in southwest China, because of the relative lack of higher education resources in Guangxi and the backward level of industrial development compared with the eastern coastal region.

As of 2022, there are 19 application-oriented universities in Guangxi, namely, Nanning University , Liuzhou Institute of Technology, Guilin University, Guangxi Science & Technology Normal University, Baise University, Hechi University, Hezhou University,

Wuzhou University , Beibu Gulf University , Yulin Normal University, Guangxi University of Finance and Economics, Guangxi University of Foreign Studies, Xingjian College of Arts and Science of Guangxi University, Xiangsihu College of Guangxi University for Nationalities, Bowen College of Guilin University of Technology College, Sainz College of Guangxi University of Traditional Chinese Medicine, Shiyuan College of Guangxi Normal University, Guilin Institute of Aerospace Technology, Guilin Institute of Information Technology. The development of these universities has the above-mentioned problems in different degrees.

In general, the proposal of "application-oriented university" provides a new model for local universities and new undergraduate universities in Guangxi, bringing new development space and opportunities, and also posing more challenges to them.

Related research

This study investigates the management strategy of industry-education integration in application-oriented universities. Through literature search and analysis of key words related to this study, we found that the relevant studies are mainly distributed in the following areas: research on the strategy of industry-education integration, the concept of running an application-oriented universities, and cooperation between research and university enterprises.

Research on the integration strategy of industry-education integration

Gao Shengxing, Tao Liping. (2022). From the new connotation of regional vocational education industry-education integration in the era of digital economy, it is proposed to clarify the three core meanings of "connection", "data" and "intelligence" in the digital connotation construction of industry-education integration. Based on the all-round "connection" inside and outside of industry and education, we promote the great expansion of "data" of industry and education, and realize the "intelligent" development strategy of the integration system of industry and education, so as to form a good ecology of industry and education co-prosperity. This will lead to a good ecology of co-prosperity between industry and education.

Li Mengqing, Chen Zhuping. (2022). The strategy of deepening the integration of industry and education by adhering to the orientation of cultivating high-quality technical and skilled talents, strengthening the cooperation between schools and enterprises, deepening the integration of industry and education, focusing on resources, system, culture, etc., bringing together the government, schools, industry and enterprises, playing the government's macro-control function, building a long-term mechanism for the integration of industry and education, establishing an open and inclusive education system, and carrying out dynamic monitoring and multi-dimensional evaluation to promote the deep integration of industry and education.

Tao Dawei. (2022). Compared with the current realistic dilemma of integration of industry and education in higher education institutions, four promotion strategies are proposed to use the government's coordinating function, improve the school education system, stimulate enterprises' participation enthusiasm and build a long-term mechanism of integration.

Hu Dexin, Chen Runge. (2021). Based on the social structuring theory, it is proposed that higher education institutions can be divided into four development paths with different styles: autonomous construction, collaborative cooperation, dependent development and passive development.

Zhang ZJ et al. (2021). It is proposed that the construction of industry-education integration should take the city of industry-education integration as the node to coordinate the strategic layout of regional coordinated development; take the industry-education integration industry as the fulcrum to strengthen the supervision function of industry-education integration development; and take the enterprise of industry-education integration as the focus to implement the main responsibility of school-enterprise collaborative education.

Wang Zhenhong. (2021). Based on the innovative school running practice of high-level small and medium-sized city vocational schools, we propose the following strategies: to improve internal governance as the "first move", integrate school running stock resources; to use the integration platform as the "gathering place" to gather multiple

school running resources; to use professional cluster development as the "breakthrough" to efficiently play resource benefits; to use applied technology research and development as the "booster" to realize the mutual integration of school-enterprise resources.

Cui Zhiyu, Chen Peng, Ni Juan. (2020). It is proposed that by taking professional clusters as the main body of school-enterprise co-construction of industrial colleges to realize the synergistic development of professional clusters and industrial clusters, and by using big data as the basis of school-enterprise co-research monitoring system to ensure the professional cluster construction keeps pace with the times and the seamless connection between professional cluster talent development specifications and vocational job clusters, so as to promote the sustainable and healthy development of professional cluster construction in higher vocational colleges.

Zhang H, Gu YA, Zhang GH. (2019). Through the empirical analysis of the construction of specialties in 20 universities in Jiangsu, we put forward the suggestions of the integration of industry and education to promote the construction of first-class undergraduate majors in application-oriented universities as a whole. In the face of the lack of focus and fragmentation in the construction of specialties, it is necessary to dovetail with the development of industrial clusters and build application specialty clusters in the layout of specialty structure; in the face of the high repetitiveness of some specialties and their detachment from the needs of industrial development, it is necessary to closely follow the characteristics of regional industries in the condensation of schooling characteristics to create specialties with advantages; in the face of the low level of construction of specialties and overall specialties and the low overlap with key disciplines, it is necessary to concentrate superior resources in the improvement of schooling quality. In the face of the low level of specialties and overall specialty construction and the low overlap with key disciplines, it is necessary to concentrate advantageous resources and promote the integration of disciplines and specialties.

Pan Jianhua. (2019). It is pointed out that the construction of vocational education industry-education integration-oriented enterprises has a solid theoretical foundation, historical foundation, contemporary foundation, practical foundation and industrial

foundation. The construction of vocational education industry-education integration-oriented enterprises requires joint efforts in terms of sound institutional arrangements, activation of endogenous power, and development of provincial standards.

Hu JP, Gu J, Wu ZM. (2019). In view of the problems and challenges faced by the high-quality development of higher vocational education, the construction strategies are proposed, such as integrating industry and education, cooperating with enterprises to implement talent development and technological innovation, cultivating first-class brand majors under the leadership of clusters, systematically planning to build a "double-teacher and four-competent" teacher team, enhancing the effectiveness of service development by combining education and training, forming a new pattern of opening up to the outside world through innovative paths, and improving internal governance through multi-governance.

Weng Weibin. (2019). In the process of platform construction, it is necessary to update thinking, seek breakthroughs in institutional mechanisms, strengthen strategic research, improve management level, and give full play to the role of industry-education integration platform as a "field" for industry-university interaction and innovation in accordance with the principle of "integrated planning, highlighting key points, optimizing configuration, and deepening management".

Chen D, Zhou P. (2019). In the face of the historical mission of building an innovative country in the new era and the inherent prescriptive task of comprehensively promoting the reform of university talent cultivation system, top universities can also achieve breakthroughs in four paths: strengthening management, leading teaching, casting brand and highlighting effectiveness.

Weng Weibin. (2019). It is considered that strengthening the construction of enterprise university is one of the ways to promote the change of university form. The knowledge production services provided by enterprise universities are integrated with the production practices of enterprises. Building enterprise universities is the demand of deep integration of industry and education. The enterprise university highlights the meaning and value of the integration of industry and education. At present, the construction of

enterprise university requires a clear understanding of its elements and the improvement of enterprise university ecosystem and the innovation of enterprise external system construction.

Qiu Hui, Fan Qian. (2016). It is believed that the insufficient participation of enterprises, the insufficient government promotion and the insufficient financial investment affect the function of the power mechanism of the integration of industry and education. In order to further promote the deep integration of industry-education, a breakthrough must be achieved in the areas of seeking the fit between the interests of universities and enterprises, improving the management and guarantee system, and establishing a diversified funding mechanism.

Philosophy of Application-oriented universities

Lain. (2008). examines the Finnish concept of "academic entrepreneurship" with the example of Sakakunda University of Applied Sciences. He argues that in a knowledge-based economy, a deeper and more productive interaction between higher education and industry is needed. The full development of knowledge in higher education requires strategies, incentives, appropriate systems, and strong interaction between migration processes and major processes. In a knowledge economy, knowledge is more likely to be created if there is potential for applied collaboration. In many cases, knowledge creation is achieved through long-term partnerships based on trust, commitment, and mutual benefit.

Pan Maoyuan. (2009). suggests that, based on the differences in the history, scale, type, layout, and conditions of local undergraduate institutions in China, most local undergraduate institutions should be positioned as application-oriented, oriented to local services, and cultivate a large number of application-oriented specialists.

Bockerman et al. (2011). also studied the impact of introducing a multidisciplinary technical education system in Finland on its labor market. It was found that after the multidisciplinary technical reform gradually transformed the former vocational colleges into multidisciplinary technical colleges, graduates' earnings and employment levels increased significantly in business and management fields.

Taatila & Raij. (2012). suggest that the mission of applied technology universities is influenced by the explanatory paradigm of the social sciences by analyzing the use of pragmatist philosophy in Finnish applied technology universities. At least in applied disciplines, relatively pragmatic pedagogical approaches including the development of learning action models are effective and pragmatism should be used as a philosophical basis for education by universities of applied technology.

Idialu. (2013). argues that the quality assurance system in vocational education involves the whole process of vocational education activities - such as teaching, learning, infrastructure, and students' behavior. Vocational education should pay strict attention to quality, because quality education is very necessary in the whole process of students' development, which is related to their development, employment prospects, and achievement of academic goals. If the quality assurance system in vocational education must be realized in universities, urgent measures are also needed to cope with the reform program.

Qu Dianbin. (2014). pointed out that the transformation and development of local undergraduate institutions face a series of problems such as school philosophy, school orientation, professional construction, training system, faculty construction, teaching mode, scientific research, management style, and resource allocation.

Based on the realization of the popularization of higher education and the modernization of education system (undergraduate education type, vocational education level and lifelong education) in China, Chen Feng. (2014). believed that it is an inevitable trend to guide a group of undergraduate universities to transform into applied technology universities.

Liu Zaizhou. (2015). points out that the "horizontal expansion" of higher education - the expansion of high school advancement rate - and "vertical extension" - the expansion of students' learning years and learning behaviors - are the most important aspects of higher education. The extension of students' learning years and learning behaviors, as well as the demand for lifelong education, are the main reasons for forcing a group of local undergraduate universities to transform and develop into application-oriented universities.

The Research Report on the Practice and Policy of Transformation Development of Local Undergraduate Universities argues that the development dilemma of local undergraduate universities and the great difficulties of higher education in serving economic development (manifested by the coexistence of difficulties in employment of college students and labor shortage in industrial enterprises) are the main reasons for the transformation and development of local undergraduate universities.

Hou Changlin et al. (2015). made a distinction among application-oriented universities, arguing that application-oriented universities, service universities, technology universities, entrepreneurial universities, teaching universities and teaching service universities all belong to the category of application-oriented universities, and that the transformation and development of new undergraduate institutions should choose the type of development according to multiple situations.

Zeng Shuqin. (2016). pointed out that in the current development process of local undergraduate institutions, there are problems such as blind promotion, emphasis on the direction of higher-level institutions, emphasis on knowledge education and neglect of the cultivation of students' practical skills, severe employment situation of undergraduate students, and difficulty in applying what they have learned.

Xiao Fuliu. (2019). proposes that, in view of the current phenomenon of derailment and disconnection of college-bachelor articulation education, the OBE education concept can be applied to facilitate the realization of seamless articulation of college-bachelor articulation, the construction of college-bachelor articulation curriculum system and the alignment of college-bachelor articulation majors, and the cultivation of college-bachelor articulation talents can be realized by formulating training objectives, clarifying graduation requirements, optimizing curriculum system and improving quality assessment mechanism. Optimization.

Yin Hui. (2020). pointed out that the problems in the orientation of application-oriented universities are mainly in three aspects: one is the academic orientation of the type of education, the other is the upgrade of the level of education, and the third is the false high orientation of the goal of education. In this regard, it is necessary to improve

the policy and system system at the government level, to respond to the situation of applied education reform and development at the school level, and to create a social atmosphere conducive to the development of applied education at the society level.

According to Bu Dunrong. (2022), application-oriented universities are a group of higher education institutions with various levels, categories and levels. The logic of its existence and the organization mechanism of its operation have their special characteristics, which are mainly reflected in the practical, actual and practical aspects. However, different time and space environments have different needs for running application-oriented universities, thus shaping their respective characters.

University-enterprise cooperation in application-oriented universities

The results of Lepori & Kyvik's (2010) comparative analysis of the development of applied technology university research and its impact on the structure of higher education systems in eight European countries show that the enhancement of research is mostly seen as academic transfer in cases where applied technology universities try to become more similar to universities. However, convergence is only one possibility, and in countries such as Finland and Switzerland, specialized research at universities of applied technology is concentrated in both applied research and regional cooperation. A specific rationale of these institutions is oriented towards regional development, and the alliance of economic interests and a strong sense of cooperation among universities of applied technology are key factors contributing to the development of research at universities of applied technology.

Akomaning et al. (2011). found through a survey of students' internships in the hospitality sector in Ghana that the weak link between educational institutions and the hospitality industry poses many difficulties for interns and that there should be readiness for collaboration, longer internships, and motivation for industry and faculty involvement in internships.

Alves et al. (2015). found that higher education institutions in Portugal, especially multidisciplinary technical institutions, are recognized as key to regional development. However, due to the economic recession and budget constraints in recent years, the

contribution of higher education institutions in community and economic development has been questioned. Therefore, the economic impact of multidisciplinary technical institutions in different socioeconomic characteristics needs to be evaluated.

Wang Luyuan. (2016). found that scientific research evaluation in scientific research in application-oriented universities in China is currently facing the problems of separation between scientific research and university orientation, deviation between scientific research and teachers' professional development, and disconnection between scientific research and transformation of results. This is related to the lack of systematic evaluation of scientific research in universities, insufficient qualitative evaluation and deviation of evaluation objectives. Therefore, improving the scientific research evaluation system of application-oriented universities, building scientific research evaluation institutions in the field and establishing the status of transformation of scientific research results in scientific research evaluation have an important role in promoting the development of scientific research in application-oriented universities.

Chen Xing. (2017). pointed out that due to the disadvantages in funding, reputation, faculty, scientific research and policies, application-oriented universities are in a marginal position in China's higher education system, and their development is dependent on the research universities in the central position. This "center-edge" structure of higher education system causes application-oriented universities to struggle in the target orientation of industry-education integration, financial investment, adjustment of disciplines and specialties, university-enterprise cooperation and construction of "double-teacher and double-competent" teachers. The government's resource tilting, decentralization and empowerment of application-oriented universities can help application-oriented universities transcend structural limitations and deepen the integration of industry and education.

Cai Jingmin et al. (2019). found that the integration of industry and education is an important grasp to improve the quality of applied talents cultivation and regional economic and social innovation development, and it is also a necessary way to build a high-level application-oriented universities. Only based on the reasonable cognition of the

connotation of the integration of industry and education in application-oriented universities and the strengthening of the mechanism innovation of the integration of industry and education in application-oriented universities can we continuously and deeply promote the integration of industry and education.

Zhang Jun. (2020). emphasized that the deep integration of industry and education is not only the realistic need of national innovation development, but also the internal driving force of economic transformation and upgrading, and the necessary road of quality development of application-oriented universities. It is necessary to innovate the mode of industry-education integration in application-oriented universities: collaborative education, creating a new ecology of industry-education integration; multifaceted integration, constructing a multi-dimensional community; and making efforts in the same direction, breaking the barriers of industry-university-research development.

Qian Cheng et al. (2020). pointed out that the integration of industry-education in application-oriented universities is deficient and lacking in internal and external driving forces, platform construction and institutional policies. To overcome the real dilemma of ineffective synergy between industry and education, it is necessary to promote the reform of industry-education applied talent development mode, build a long-term cooperation mechanism of symbiotic and win-win industry-education integration, and establish a scientific and effective assessment and incentive mechanism through dialogue, interaction and symbiosis, so as to jointly promote the deep development of industry-education integration and form a new pattern of development of industry-education integration and synergy.

Other issues in application-oriented universities

Adegoke. (2002). emphasizes that without training enough competent teachers, student development in universities of applied technology is not possible. The training of theoretical-cum-practical teachers requires proper refurbishment in the acquisition of professional skills, scientific and specialized knowledge of teachers.

Kallioinen. (2011). found that the pedagogical knowledge of the University of Applied Sciences in Larier is undergoing a dramatic change. A SWOT analysis of teachers

in the last 2 years of the PD program found that the new educational model change at the Larier University of Applied Sciences was influenced by theoretical perspectives of teachers' expertise and teaching, peer mentoring, educational leadership, teaching strategies, and other factors.

Elly. (2012). argued that higher vocational education tends to be competency-based education, which will change teachers' work behavior. Through a case study of pedagogical innovation, competency-based vocational education in the Netherlands, he found that the way teachers implement new educational concepts and the uncertainty, dilemmas, and practice challenges of their experiences have a significant impact on teachers' teaching behaviors.

Yu Guojiang. (2013). argued that the difficulty in the transformation of local undergraduate institutions lies in changing the discipline-based curriculum system and establishing a competency-based modular curriculum system.

Wang Weikun et al. (2014). argued that the government should do a good job of top-level design and clarify construction standards; improve supporting policies and clarify the responsibilities of all parties; and increase financial support and implement demonstration and leadership. Secondly, transforming institutions should realize changes in many aspects of school philosophy, school orientation, subject specialization adjustment, enrollment, talent development, faculty construction, school-enterprise cooperation, discipline construction, and applied research.

Yuan Li. (2014). the transformation of local undergraduate universities may face several dangers: application-oriented universities are reduced to "vocational training institutions" and the "new Malthusian tendency" in higher education. (2014), a tendency of education being driven by extreme utilitarianism, the reduction of government investment on the grounds of serving local communities, and the transformation of local undergraduate institutions into "superficial articles". From the perspective of transformation paths and strategies, scholars believe that the transformation and development of local undergraduate institutions require reform and cooperation among government, schools, enterprises and industries. First, the government should support the

transformation in terms of policy arrangement, financial support, education management system change, legislation and classification management.

Vuori. (2015). explored the middle management of Finnish universities of applied technology. His in-depth interviews with managers showed that the work of middle managers is characterized by a consistent pursuit of rationality and that every effort should be made to focus on the individuality of each employee and to promote cooperation among them. Moreover, Finnish universities of applied technology are trying to achieve a closer coupling between organizational subsystems and between managers and teaching staff.

Liu H et al. (2015). point out that comprehensive reform of the concept, orientation, system, management, input and evaluation of research in new undergraduate institutions is necessary to support teaching and human development in application-oriented universities.

According to Du Chi (2015), the success of application-oriented universities in continental countries has its special cultural background, social structure, public policy system arrangement and path choice, and in the process of learning from the mode of running application-oriented universities in continental countries, China should clarify the concept of higher education, improve the funding allocation system, improve the employment guarantee system, unify the labor market system, and open the social class structure and occupational structure, etc. The process should be promoted in a concerted manner. Fourth, many researchers believe that the transformation of local institutions must actively play the power of industry and enterprises.

Chapter 3
Research Methodology

The purpose of this research is to study the following aspects: 1) to study the level of industry-education integration of Application-oriented Universities in Guangxi, 2) to develop strategies of development for industry-education integration of Application-oriented Universities in Guangxi, 3) to evaluate the strategies of development of industry-education integration of Application-oriented Universities in Guangxi. In order to solve the problems mentioned in Chapter 1 and achieve the above research objectives, the researchers adopted the following research procedures, as follows:

1. The population and the sample Group
2. Research Instruments
3. Data Collection
4. Data Analysis

Population and the Sample Group

Population

The Population of this research were 10 application-oriented Universities in Guangxi. Totaling 259 managers of industry-education integration.

The Sample Group

According to Krejcie and Morgan (1970) sampling table, the sample group were manager who involved in the industry-education integration at application-oriented university in Guangxi. They were selected by purposive sampling method from 10 universities which located in different city in Guangxi, and used by systematic random sampling, totaling 155 people.

The 10 universities selected include: Nanning University, Liuzhou Institute of Technology, Guilin University, Guangxi Science & Technology Normal University, Baise

University, Hechi University, Hezhou University, Wuzhou University, Beibu Gulf University, and Yulin Normal University. Among them, Nanning University, Liuzhou Institute of Technology, Guilin University are private universities; the rest are public universities.

Interviewee

In this study, 10 people from Guangxi application-oriented universities will be interviewed in this study to understand the current situation of the integration of industry-education in Guangxi application-oriented universities. The interviewees must meet the following criteria**:** 1) middle managers of Guangxi application-oriented universities who had been involved in the management of the integration of education and industry for 10 years or more; 2) were familiar with the operation mode of enterprises and universities and had a deeper understanding of the integration of education and industry; 3) must be willing to participate in the recorded semi-structured interviews; and 4) must be willing to review their interview transcripts for validation.

Strategy evaluation team

Based on the actual situation of the integration of industry-education work in application-oriented universities, five people are selected to evaluate the management strategy of Guangxi application-oriented universities based on the integration of industry-education, who meet the following conditions: 1) managers who have been involved in the integration of industry-education work for 5 years or more; 2) come from different universities; 3) have a senior title or doctorate degree and have a deeper understanding and research on the integration of industry-education work.

Table 3.1 Sampling table

Serial number	Application-oriented Universities	Population	The Sample Group
1	Nanning University	25	16
2	Liuzhou Institute of Technology	27	16
3	Guilin University	21	16
4	Guangxi Science & Technology Normal University	29	16
5	Baise University	26	16
6	Hechi University	25	15
7	Hezhou University	34	15
8	Wuzhou University	24	15
9	Beibu Gulf University	25	15
10	Yulin Normal University	23	15
Total		**259**	**155**

Research Instruments

The instruments used in this study include questionnaires, interview forms, and an evaluation form of management strategies for the integration of industry and education in Guangxi application-oriented universities. The specific contents include:

Questionnaire

The questionnaire used in this study consists of three main parts. The first part is a survey of the basic information of the respondents. In order to facilitate the classification of respondents and statistical analysis, this part contains the respondents' units, gender, age, educational background, job title and working years. The second part is the evaluation of the respondents on the work of integration of industry and education in their units. It

is to understand the statistics of a total of 32 questions in 4 aspects of the integration of industry and education in the sampled universities: teacher resources management, financial management, management mechanism and talent cultivation. The main part of the questionnaire adopts a 5-level Likert scale, "1" means "strongly disagree", "2" means "basically disagree", "3" means "not sure", "4" means "basically agree" and "5" means "strongly agree". The questionnaire survey will be conducted through the "Questionnaire Star" APP, which facilitates the distribution, collection and statistics of the questionnaire.

Interview Form

According to the research analysis of related literature and the statistical results of questionnaire data, the interview outline of "Interview outline of strategic development of integration of education and industry in Guangxi application-oriented universities" is prepared around the contents of 4 variables that affect the integration of education and industry, and structured interviews are conducted with middle managers who are involved in the integration of education and industry in different universities, and the interviewees are required to follow the interview outline, respectively, from 4 aspects of teacher resources management, financial management, management mechanism and talent development According to the interview outline, the interviewees were required to describe the current situation of the integration of education and industry in Guangxi application-oriented universities and suggest management strategies. The researcher composes and analyzes the interview contents, combines the existing research results, and proposes the management strategies for the integration of production and education in Guangxi application-oriented universities.

Assessment checklist of Strategies of development for Industry-Education Integration of Application-Oriented Universities in Guangxi

According to the questionnaire and interview results, combined with the previous literature and theoretical basis, this study sets up an evaluation form and submits the researcher's proposed management strategies for the integration of industry-education in

Guangxi application-oriented universities to experts for evaluation. The experts are required to check the adaptability and feasibility of the strategies proposed by the researcher and make suggestions for improvement.

Data Collection

The data of the questionnaire part were distributed and collected in the form of electronic questionnaires to the managers' part of 10 universities, including Nanning University, Liuzhou Institute of Technology, Guilin University, Guangxi Science & Technology Normal University, Baise University, Hechi University, Hezhou University, Wuzhou University, Beibu Gulf University, and Yulin Normal University, with 15-16 people per universities and 155 questionnaires in total.

The interview section was conducted by the researcher who recorded and collected data in real time from the 10 interviewees during the interview process, and categorised and organised them for storage.

The data for the evaluation component was distributed and collected from 5 experts in the form of a questionnaire.

Data Analysis

Using descriptive statistics, the questionnaire statistics were processed and the current situation of the integration of industry-education in Guangxi applied universities was analysed through the mean and standard deviation.

Using content analysis methods to analyse and sort out the interview data, extract and summarise effective information, and propose strategies and relevant measures for the management of the integration of industry-education in Guangxi applied universities, in conjunction with the foundation of previous studies.

Using descriptive statistics, the strategies and measures proposed in this study were assessed by means and standard deviations.

Data interpretation

In the mean value analysis of the current level of management of the integration of industry and education in Guangxi application-oriented universities, the researcher defined the data interpretation criteria. Specifically, they are as follows:

4.51-5.00 refers to the highest level

3.51-4.50 is the high level

2.51-3.50 is the medium level

1.51-2.50 refers to low level

1.00-1.50 refers to the lowest level

For the analysis of the adaptability and feasibility of the management strategy of the integration of industry and education in Guangxi application-oriented universities, the researcher defined the data interpretation criteria. They are shown as follows:

4.51-5.00 refers to the highest level

3.51-4.50 is the high level

2.51-3.50 is the medium level

1.51-2.50 refers to low level

1.00-1.50 refers to the lowest level

Chapter 4

Results of Analysis

According to the research objectives of Strategies of development for industry-education integration of Application-oriented Universities in Guangxi, it is required 1) to study the level of industry-education integration of Application-oriented Universities in Guangxi, 2) to develop strategies of development for industry-education integration of Application-oriented Universities in Guangxi, 3) to evaluate the strategies of development of industry-education integration of Application-oriented Universities in Guangxi. Based on this, the researcher presented research results on the following topics:

Part 1: Personal information of managers involved in the industry-education integration, classified by of the school, gender, age, education, professional title, and work experience year.

Part 2: Data analysis of the current situation of industry-education integration in Guangxi Application-oriented Universities.

Part 3: Implementation and analysis results of strategies for Development industry-education integration in Guangxi Application-oriented Universities.

Part 4: Adaptability and Feasibility evaluation results of the implementation of strategies for Development industry-education integration in Guangxi Application-oriented Universities.

The details are as follows.

Data Analysis result

Part 1: Personal information of managers involved in the industry-education integration, classified by of the school, gender, age, education, professional title, and work experience year.

Table 4.1 Number and percentage of respondents (n = 155)

	Personal information	**Number of people**	**Percentage (%)**
school	Nanning University	16	10.32
	Liuzhou Institute of Technology	16	10.32
	Guilin University	16	10.32
	Guangxi Science & Technology Normal University	16	10.32
	Baise University	16	10.32
	Hechi University	15	09.68
	Hezhou University	15	09.68
	Wuzhou University	15	09.68
	Beibu Gulf University	15	09.68
	Yulin Normal University	15	09.68
	Total	**155**	**100**
Gender	male	66	42.58
	female	89	57.42
	Total	**155**	**100**
Age	25 years old or below	9	05.81
	26 to 35	47	30.32
	36 to 45	64	41.29

Table 4.1 Number and percentage of respondents (continue) (n = 155)

	Personal information	Number of people	Percentage (%)
	46 to 55	24	15.48
	56 years old or up	11	07.10
	Total	**155**	**100**
Education	Bachelor degree	16	10.32
	Master's degree	109	70.32
	Doctoral degree	30	19.35
	Total	**155**	**100**
professional title	Teaching assistant	16	10.32
	The lecturer or Assistant Professor	49	31.61
	Associate professor	63	40.65
	Professor	27	17.42
	Total	**155**	**100**
work experience year	within 5 years	11	07.10
	5 to 10 years	42	27.10
	11 to 15 years	49	31.61
	16 to 20 years	22	14.19
	More than 20 years	31	20.00
	Total	**155**	**100**

According to Table 4.1, the distribution of respondents' schools shows that male respondents for 66 people accounted for 42.58%, and female respondents for 89 people accounted for 57.42%. Respondents' age distribution is as follows: 9 people accounted for 5.81% are between 25 years old or below, 47 people accounted for 30.32% are between 26-35 years old, 64 people accounted for 41.29% are between 36-45 years old, 24 people

accounted for 15.48% are between 46-55 years old, and 11 people accounted for 7.10% are 56 years old or older. In terms of educational background, 16 people accounted for 10.32% of respondents hold a bachelor's degree, 109 people accounted for 70.32% hold a master's degree, and 30 people accounted for 19.35% hold a doctoral degree. The professional titles of respondents are as follows: 16 people accounted for 10.32% are teaching assistants, 49 people accounted for 31.61% are lecturers, 63 people accounted for 40.65% are associate professors, and 27 people accounted for 17.42% are professors. In terms of years of experience, 11 people accounted for 7.10% of respondents have less than 5 years of experience, 42 people accounted for 27.10% have 5-10 years of experience, 49 people accounted for 31.61% have 11-15 years of experience, 22 people accounted for 14.19% have 16-20 years of experience, and 31 people accounted for 20.00% have more than 20 years of experience.

Part 2: Data analysis of the current situation of industry-education integration of Application-oriented Universities in Guangxi

In accordance with the results of questionnaires, this study analyzed the level of industry-education integration in Guangxi Application-oriented Universities from 4 aspects: including 1) Teacher resources management, 2) Financial Management, 3) Management Mechanism and 4) Talent Development. The average value and standard deviation were attained. The survey questionnaire used in this study was specifically designed by the researchers for this study, and the survey results are as follows:

Table 4.2 The average and standard deviation of the current situation of industry-education integration of Application-oriented Universities in Guangxi in four aspects

(n = 155)

Industry-education integration of Application-oriented Universities in Guangxi	$\overline{X}$	S.D.	level	order
Teacher resources management	3.29	1.12	Medium	3
Financial Management	3.25	1.13	Medium	4
Management Mechanism	3.42	1.15	Medium	1
Talent Development	3.39	1.12	Medium	2
Total	**3.34**	**1.13**	**Medium**	

According to Table 4.2, the data showed that the current situation of industry-education integration of Application-oriented Universities in Guangxi in four aspects was at medium level ($\overline{X}$ = 3.34). Consider for the result of the study aspects ranged from the highest to the lowest level were as following: the highest level was management Mechanism ($\overline{X}$ = 3.42), followed by talent Development ($\overline{X}$ = 3.39), and financial Management was the lowest level ($\overline{X}$ = 3.25).

Table 4.3 Analysis result of the current situation of industry-education integration of Application-oriented Universities in Guangxi in Teacher resources management

(n = 155)

Teacher resources management	$\overline{X}$	S.D.	level	order
1. Managers have human resource management skills	3.68	1.14	high	1
2. Universities have a sound Teacher resources management mechanism	3.51	1.11	high	2
3. university teachers have working experience in enterprises	3.18	1.15	Medium	6
4. The management mode of joint training of teachers by universities and enterprises	2.92	1.06	Medium	8
5. A mutual appointment system between university teachers and enterprise engineers is in place	3.39	1.13	Medium	3
6.Sufficient teachers with enterprise experience	3.25	1.05	Medium	5
7. Universities have a mechanism for the growth of teachers with enterprise practice and training	3.06	1.05	Medium	7
8. Teachers are highly motivated to participate in practical training in enterprises	3.33	1.08	Medium	4
Total	**3.29**	**1.12**	**Medium**	

According to Table 4.3, the data showed that the current situation of industry-education integration of Application-oriented Universities in Guangxi in teacher resources management was at medium level ($\overline{X}$ = 3.29). Consider for the result of the study aspects ranged from the highest to the lowest level were as following: the highest level was managers have human resource management skills ($\overline{X}$ = 3.68), followed by universities have a sound Teacher resources management mechanism ($\overline{X}$ = 3.51), and t he management mode of joint training of teachers by universities and enterprises was the lowest level ($\overline{X}$ = 2.92).

Table 4.4 Analysis result of the current situation of industry-education integration of Application-oriented Universities in Guangxi in Financial Management

(n = 155)

Financial Management	$\overline{X}$	S.D.	level	order
1. The financial management system of universities in the integration of education and industry	2.99	1.01	Medium	8
2.Universities have clear planning in financial analysis and control	3.46	1.15	Medium	3
3. University managers have scientific financial decision-making ability	3.52	1.12	High	2
4. Management mode of joint venture between universities and enterprises	3.18	1.03	Medium	4
5. Universities have sufficient financial investment in the integration of education and industry	3.17	1.22	Medium	5
6. Effective management and use of funds are achieved	3.55	1.15	High	1
7. Universities can add value to corporate brands	3.05	1.06	Medium	6
8. Universities can increase the income of enterprise profit	3.07	1.13	Medium	7
Total	**3.25**	**1.13**	**Medium**	

According to Table 4.4, the data showed that the current situation of industry-education integration of Application-oriented Universities in Guangxi in financial management was at a medium level ($\overline{X}$ = 3.25). Among them, " Effective management and use of funds are achieved " ($\overline{X}$ =3.55) and " University managers have scientific financial decision-making ability " ($\overline{X}$ =3.52) are high level and rank in the top two. The rest were medium level, with the lowest score for " The financial management system of universities in the integration of education and industry ". ($\overline{X}$ = 2.99).

Table 4.5 Analysis result of the current situation of industry-education integration of Application-oriented Universities in Guangxi in Management Mechanism

(n = 155)

Management Mechanism	$\overline{X}$	S.D.	level	order
1. Managers have the ability to manage the integration of education and industry in universities	3.52	1.08	High	3
2. Universities have a perfect management mechanism for the integration of education and industry	3.15	1.03	Medium	8
3. The managers of universities have management experience in the integration of education and industry	3.39	1.18	Medium	4
4. Management mode of integration of education and industry between universities and enterprises	3.66	1.12	High	2
5. Mutual appointment system between university managers and senior managers of enterprises	3.81	1.28	High	1
6. People with rich experience in enterprise management serve as education managers for the integration of education and industry	3.17	1.15	Medium	7
7. The growth mechanism of university managers with the integration of education and industry	3.29	1.10	Medium	6
8. High enthusiasm of managers of the integration of education and industry in universities to participate in enterprise practice and posting	3.35	1.14	Medium	5
Total	**3.42**	**1.15**	**Medium**	

According to table 4.5, the data showed that the current situation of industry-education integration of Application-oriented Universities in Guangxi in Management Mechanism was at a medium level ($\overline{X}$ = 3.42). From the study results, the highest score was given to " Mutual appointment system between university managers and senior

managers of enterprises " ($\overline{X}$ = 3.81), followed by " Management mode of integration of education and industry between universities and enterprises " ($\overline{X}$ = 3.66), while the lowest score was given to " Universities have a perfect management mechanism for the integration of education and industry ". ($\overline{X}$ = 3.15).

Table 4.6 Analysis result of the current situation of industry-education integration of Application-oriented Universities in Guangxi in Talent Development

(n = 155)

Talent Development	$\overline{X}$	S.D.	level	order
1. A perfect education system for the integration of education and industry is available	3.29	1.18	Medium	6
2. Universities have cultivation mode for students' internship	3.51	1.08	High	4
3. Universities and enterprises have the training mode of alternating engineering	3.39	1.10	Medium	5
4. Scientific talent cultivation mode of integration of education and industry	3.01	1.01	Medium	8
5. Universities and enterprises jointly carry out professional skills certification	3.62	1.12	High	2
6. Universities and enterprises jointly build teaching resources library	3.06	0.96	Medium	7
7. Universities and enterprises jointly build talent cultivation mechanism	3.67	1.21	High	1
8. Universities and enterprises jointly cultivate talents that meet the needs of regional industries	3.53	1.08	High	3
Total	**3.39**	**1.12**	**Medium**	

According to Figure 4.6, the data showed that the current situation of industry-education integration of Application-oriented Universities in Guangxi in Talent Development was at a medium level ($\overline{X}$ = 3.39). From the results of the study, the highest score was given to " Universities and enterprises jointly build talent cultivation mechanism " ($\overline{X}$ = 3.67), followed by " Universities and enterprises jointly carry out professional skills

certification " ($\overline{X}$ = 3.62), and the lowest score was given to "a scientific talent cultivation model that integrates industry and education". ($\overline{X}$ = 3.01).

Part 3: Implementation and analysis results of strategies for Development industry-education integration in Guangxi Application-oriented Universities.

In this study, 10 people from Guangxi application-oriented universities are interviewed in this study to understand the current situation of the integration of industry-education in Guangxi application-oriented universities. The interviewees must meet the following criteria**:** 1) middle managers of Guangxi application-oriented universities who had been involved in the management of the integration of education and industry for 10 years or more; 2) were familiar with the operation mode of enterprises and universities and had a deeper understanding of the integration of education and industry; 3) must be willing to participate in the recorded semi-structured interviews; and 4) must be willing to review their interview transcripts for validation.

The list of interviewees is as follows:

Table 4.7 Basic information of Interview

Interviewees	Age	Gender	Education	Job Title	work experience in university (years)
Interviewee 1	47	F	Master's degree	Dean, School of Art and Design	22
Interviewee 2	41	M	Master's degree	Director of Academic Affairs Office	17
Interviewee 3	48	F	Master's degree	Director of the Audit Office	25
Interviewee 4	41	M	Master's degree	Dean of College of Food and Chemical Engineering	15
Interviewee 5	40	F	Master's degree	Director of Student Work Office	13

Table 4.7 Basic information of Interviewees (continue)

Interviewees	Age	Gender	Education	Job Title	work experience in university (years)
Interviewee 6	39	M	Master's degree	Deputy Director of the President's Office	14
Interviewee 7	48	M	Master's degree	Director of the Office of Asset Management	22
Interviewee 8	40	M	Doctor's degree	Vice Dean of College of Humanities, Arts and Design	12
Interviewee 9	43	M	Master's degree	Vice Dean of College of Digital Economy	20
Interviewee 10	47	M	Master's degree	Dean of School of Economics and Management	17

The research team conducted 10 face-to-face interviews. Each interview was conducted one-on-one in a more private location where others could not overhear the conversation, ensuring that the interviewees were not disturbed by other factors.

The interview is as follows:

Interviewee 1

1. Regarding the current situation of teacher resources management in the integration of industry and education in Guangxi application-oriented universities, what management strategies are suggested for teacher resources management?

Regarding the current situation of teacher resources management of the integration of industry and education in Guangxi application-oriented universities, the following management strategies are suggested: formulate clear policies on teacher resources

management of the integration of industry and education, including recruitment, training, evaluation and incentive, to ensure the stability and high quality of the faculty. Provide a good working environment and career development opportunities to attract and retain outstanding faculty members and promote their active participation in the integration of industry and education.

2. Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities, what kind of management strategies are suggested in terms of financial management?

Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities, the following management strategies are suggested: strengthen financial supervision and risk management, strictly control the use of funds for the integration of education and industry projects and prevent financial risks. Encourage diversified sources of funding, including government funds, enterprise input and social donations, to improve sustainable financial security for the integration of education and industry projects. Strengthen the management and reporting of financial information and provide timely and accurate financial statements to provide scientific basis for decision-making.

3. Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, what kind of management strategies are suggested in terms of management mechanism?

Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, the following management strategies are suggested: establish a clear management system of the integration of education and industry, including organizational structure, division of responsibilities and process specification, to ensure the efficient operation of the integration of education and industry. Strengthen internal and external cooperation and communication to form an integrated management mode of industry-university-research-application and promote resource sharing and complementary advantages. Set up a special management team for the integration of industry-education, responsible for

project planning, organization and implementation, effect evaluation, etc. to guarantee the professionalism and continuity of management.

4. Regarding the current situation of talent development in the integration of industry and education in Guangxi application-oriented universities, what kind of management strategies are suggested for talent development?

Regarding the current situation of talent cultivation in the integration of industry and education in Guangxi application-oriented universities, the following are some management strategy suggestions: optimizing the talent cultivation program, incorporating industrial demands into the curriculum design and talent cultivation plan, and Development students' practical ability and application ability. Promote the in-depth integration of industry-university-research, strengthen the cooperation between schools and industry, establish a joint mechanism for training talents from industry-university-research, provide opportunities for industrial internships, practical training and innovative projects, and cultivate high-quality applied talents that meet the needs of industrial development. Strengthen students' career planning and employment guidance, provide career counselling, expand employment channels and entrepreneurial support, and guide students to make career planning and choices according to their interests and industrial needs. Establish a mechanism to assess the quality of talent development in industry-university research, and continuously improve the talent development programme through multi-dimensional assessments such as students' practical achievements, graduation employment rate and evaluation by employers, so as to improve the quality of talent development and its adaptability to industry.

Interviewee 2

1. Regarding the current situation of Teacher resources management in the integration of industry-education in Guangxi application-oriented universities, what management strategies are suggested for Teacher resources management?

Regarding the current situation of Teacher resources management in the integration of industry-education in Guangxi application-oriented universities, the following are some

suggested management strategies: regularly conduct surveys and forecasts on teacher demand, and plan and allocate teachers in a scientific and reasonable manner according to the demand of the integration project. Establish a comprehensive teacher training system, including teacher training programmes, training resources and training evaluation, to enhance teachers' ability and practical experience in the integration of industry and education. Formulate teacher incentive policies, including salary incentives, title assessment, research support, etc., to attract and motivate outstanding teacher talents to participate in the integration of industry-education projects. Strengthen the performance assessment and evaluation of teachers and use performance as a guide to stimulate teachers' enthusiasm and creativity.

2. Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities, what kind of management strategies are suggested in terms of financial management?

Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities, the following are some suggested management strategies: establish a sound financial management system and internal control mechanism, including financial budget, fund management and accounting, to ensure the financial management of the integration of education and industry project is standardized and transparent. Strengthen financial supervision and risk management, establish a financial risk assessment system, conduct regular financial risk assessments, and identify, prevent and respond to financial risks in a timely manner. Introduce diversified sources of funding, including government funding, corporate input and social donations, to reduce the dependence on a single source of funding and improve the financial sustainability of the integration of education and industry projects. Strengthen financial reporting and information disclosure, provide timely and accurate financial statements, enhance communication and collaboration with partner enterprises and government departments, and ensure the transparency and legal compliance of financial information.

3. Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, what kind of management strategies are suggested in terms of management mechanism?

Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, the following are some suggested management strategies: to establish a clear management organization or department for the integration of education and industry, to clarify the organizational structure, division of responsibilities and workflow, and to form a scientific and efficient management system. Strengthen internal and external cooperation and communication, establish an integrated management mode of industry-university-research-application, and promote resource sharing, information sharing and benefit coordination among partners.

4. Regarding the current situation of talent cultivation in the integration of industry-education in Guangxi application-oriented universities, what kind of management strategies are suggested for talent cultivation?

Regarding the current situation of talent cultivation in the integration of industry and education in Guangxi application-oriented universities, the following are some management strategy suggestions: to set up the objectives and planning of talent cultivation in the integration of industry and education, to clarify the professional direction, subject requirements and teaching mode of cultivation, and to dovetail closely with industrial demands. Strengthen the design and implementation of industry-education integration curriculum, focus on practical teaching and practical application, and improve students' practical operation ability and practical problem-solving ability. Promote the integration of industry-education innovation and entrepreneurship education, cultivate students' sense of innovation, innovation ability and entrepreneurship, and encourage students to participate in innovation and entrepreneurship projects and practical activities. Strengthen the assessment and certification of the training of talents integrated with industry-education, establish a quality monitoring and evaluation system, and ensure that the talents trained meet the needs of industry and the expectations of society. Strengthen collaborative cooperation in the training of talents from industry to university, and

promote the participation of industry in teaching, internship and graduation design to enhance students' practical ability and employability.

Interviewee 3

1. Regarding the current situation of teacher resources management in the integration of industry and education in Guangxi application-oriented universities, what management strategies are suggested for teacher resources management?

Regarding the current situation of Teacher resources management in the integration of industry-education in Guangxi application-oriented universities, the following are some possible management strategy suggestions: formulate clear Teacher resources management policies and systems, including teacher recruitment, evaluation and appointment management, to ensure that suitable teacher resources can participate in the integration of industry-education work. Strengthen teacher training and career development support, provide relevant training programmes, financial support and promotion mechanisms, and encourage teachers to participate in industry-education integration projects and practical activities to enhance their ability to manage industry-education integration. Bring in industry professionals and practitioners with extensive practical experience as part-time teachers or visiting professors to promote cross-border collaboration and knowledge transfer in the integration of industry and education. Set up a performance evaluation and incentive mechanism to evaluate and reward teachers according to their performance and achievements in the integration of industry and education, so as to stimulate their enthusiasm to actively participate in the integration of industry and education.

2. Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities, what management strategies are suggested in terms of financial management?

Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities, the following are some possible management strategy suggestions: establish a scientific and reasonable financial

management system, including financial budgeting, accounting and auditing, to ensure the reasonable use and management of funds for the integration of education and industry projects. Set up special funds for the integration of industry and education, and establish clear procedures for the declaration, audit, use and reporting of funds, and strengthen financial supervision to ensure that the funds for the integration of industry and education projects are used in a compliant, transparent and effective manner. Introduce social capital and corporate cooperation to increase the funding sources for the integration of industry-education projects and improve financial sustainability through cooperation funds, donations and other means. Conduct regular financial reports and financial performance evaluation to monitor the financial status and performance of the integration of education and production projects, and identify and solve problems in financial management in a timely manner.

3. Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, what management strategies are suggested in terms of management mechanism?

Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, the following are some management strategy suggestions: establish a clear management institution and organizational structure for the integration of education and industry, and clarify the responsibilities and authority of management at all levels to ensure the efficient operation of the integration of education and industry. Implement information management, establish an information platform for the integration of industry-education, realise information sharing and optimisation of business processes, and improve management efficiency and the scientific nature of decision-making. Strengthen the standardised management of University-Industry Cooperation, including the signing, execution and evaluation of cooperation contracts, to ensure the smooth promotion of cooperation projects and the evaluation and improvement of cooperation effects. Strengthen the role of industry participation in management and set up industry expert committees or relevant

advisory bodies to provide professional guidance and support for the integration of industry-education.

4. Regarding the current situation of talent development in the integration of industry and education in Guangxi application-oriented universities, what kind of management strategies are suggested for talent development?

Regarding the current situation of talent cultivation in the integration of industry and education in Guangxi application-oriented universities, the following are some management strategy suggestions: to set up a multi-level and multi-discipline talent cultivation system, including undergraduate, postgraduate and continuing education, in order to meet the multi-level and multi-discipline talent needs of industrial development. Strengthen practical education and industrial training, provide abundant practical opportunities and practical project participation, and cultivate students' practical skills and innovative and entrepreneurial spirit. Promote an integrated curriculum design that integrates industry-university-research and incorporates industrial needs into the content of the curriculum to improve its practicality and vocational literacy development. Establish an effective evaluation system, including comprehensive student quality assessment and teacher education and teaching evaluation, to promote quality and continuous improvement of talent development. Strengthen cooperation with industry and establish a mechanism for joint training between industry, academia and research, including internship, practical training and laboratory co-construction, to enhance students' industrial awareness and practical skills.

Interviewee 4

1. Regarding the current situation of Teacher resources management in the integration of industry-education in Guangxi application-oriented universities, what management strategies are suggested for Teacher resources management?

Regarding the current situation of teacher resources management of the integration of industry and education in Guangxi application-oriented universities, the following are some management strategy suggestions: strengthen the selection and training of faculty

members, pay attention to the subject expertise and practical experience of teachers, and improve the overall quality of faculty members. Strengthen the structural adjustment of the faculty, focus on the introduction and training of professional faculty in industrial fields, and enhance the industrial adaptability of the faculty. Strengthen the exchange and cooperation of the faculty, encourage in-depth collaborative research and project cooperation between faculty and industrial partners, and enhance the practical experience and industrial insight of the faculty. Strengthen the interdisciplinary and interdisciplinary research of the faculty team, cultivate faculty members with strong comprehensive quality and innovation ability, and promote interdisciplinary research and practical innovation of the integration of industry and education.

2. Regarding the current situation of financial management of the integration of industry and education in Guangxi application-oriented universities, what kind of management strategies are suggested in terms of financial management?

Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities, the following are some management strategy suggestions: establish clear financial management systems and processes, including budgeting, fund management, expense control, reimbursement approval, etc., to ensure the use of funds in a compliant, transparent and efficient manner. Strengthen financial cooperation with industrial partners and establish a reasonable management model for university-industry cooperation funds, including fund raising, use and monitoring, to ensure the financial sustainability and risk control of university-industry cooperation projects. Strengthen the monitoring and analysis of financial data, identify and resolve financial problems in a timely manner, and ensure the accuracy and integrity of financial information. Introduce financial management software and information systems to enhance the automation and digitisation of financial management, reduce manual operations and manual errors, and improve the efficiency and accuracy of financial management. Strengthen financial training and knowledge updating to enhance the professional quality and financial management skills of financial management staff to ensure that they can adapt to the financial management needs of the integration of

education and industry. Enhance the strategic thinking and forward-looking management of financial management, participate in the decision-making process of the integration of education and industry, and provide financial support and decision-making reference for the implementation and development of the integration strategy of education and industry.

3. Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, what kind of management strategies are suggested in terms of management mechanism?

Regarding the current situation of the management mechanism of the integration of industry-education in Guangxi application-oriented universities, the following are some management strategy suggestions: establish inter-departmental and inter-disciplinary management institutions, including the Management Committee of University-Industry Research Cooperation and the Project Management Office of University-Industry Research Cooperation, which are responsible for coordinating, organizing and supervising the implementation and management of the integration of industry-education projects. Establish special positions and responsibilities for University-Industry Cooperation, clarify the duties and powers of relevant personnel, and establish a scientific and reasonable performance evaluation and incentive mechanism to stimulate the enthusiasm and innovative spirit of managers to actively participate in the work of University-Industry Integration. Introduce advanced management concepts and methods, such as project management, performance management and risk management, to improve the management level and efficiency of the integration of industry-education projects and ensure that the projects are completed on schedule, in terms of quality and quantity. Strengthen the management of the whole process of the industry-education integration project, including project planning, cooperation negotiation, contract management, project execution and transformation of results, to ensure that the industry-education integration project can move forward smoothly in all aspects. Strengthen the communication and collaboration with industrial partners and establish good cooperation relationship and cooperation mechanism, including cooperation agreement, project

cooperation framework, intellectual property management, etc., so as to promote the in-depth development of University-Industry Cooperation.

4. Regarding the current situation of talent development in the integration of industry-education in Guangxi application-oriented universities, what kind of management strategies are suggested for talent development?

Regarding the current situation of talent cultivation in the integration of industry and education in Guangxi application-oriented universities, the following are some suggestions on management strategies: based on industrial demands, adjust and optimize the professional settings and curriculum system, and improve the relevance and practicality of talent cultivation. Strengthen cooperation with enterprises, promote the design and implementation of industry-academia integration curriculum, closely integrate practical teaching with industrial reality, and cultivate high-quality talents with practical operation ability and innovation spirit. Provide diversified modes of talent development, including academic education, continuing education and in-company training, to meet the needs of different levels and needs of talent development. Set up a talent development quality assessment and monitoring mechanism to evaluate and provide feedback on training effectiveness and continuously optimise talent development programmes and methods. Provide good career development support, including internship, practical training, practice and employment services, etc., to help students make a smooth transition to their careers and continuously enhance their competitiveness in career development.

Interviewee 5

1. Regarding the current situation of teacher resources management in the integration of industry and education in Guangxi application-oriented universities, what management strategies are suggested for teacher resources management?

Regarding the current situation of teacher resources management for the integration of industry-education in Guangxi application-oriented universities, the following are some management strategy suggestions: formulate clear teacher resources management policies,

including recruitment, training, evaluation and incentive, to ensure the stability and high quality of the faculty. Establish an effective performance evaluation system and introduce performance assessment and incentive mechanisms to encourage teachers to actively participate in the integration of industry and education.

2. Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities, what kind of management strategies are suggested in terms of financial management?

Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities, the following are some management strategy suggestions: establish a sound financial management system, including financial budgeting, accounting and fund management, to ensure the financial operation of the integration of education and industry project is compliant and transparent. Strengthen internal control and auditing, establish a sound financial internal control system, conduct regular financial audits and risk assessments, and identify and resolve potential problems in financial management in a timely manner. Strengthen cooperation with finance departments, industrial partners and relevant units, establish information sharing and communication mechanisms, and jointly promote financial management improvement and innovation in the integration of education and industry.

3. Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, what kind of management strategies are suggested in terms of management mechanism?

Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, the following are some management strategy suggestions: to formulate scientific performance evaluation indexes, to conduct regular evaluation and monitoring of the integration of education and industry projects, and to adjust management strategies and measures in time. Strengthen the monitoring and evaluation of the integration of industry-education projects, establish a performance evaluation system, identify and solve problems in the projects in a timely manner, and enhance the overall performance and social impact of the projects.

Strengthen the management of intellectual property rights of the integration projects, including patent application, technology transfer and commercialisation, to improve the technological transformation and economic benefits of the projects. Strengthen the cooperation and participation with experts from outside the university and representatives from enterprises, etc. to form a management model of co-management and co-construction, and promote the participation and co-management of multiple parties in the integration of education and industry. Enhance the comprehensive quality and management ability of the managers, including project management, negotiation and negotiation, teamwork, innovation and entrepreneurship, etc., so as to provide strong management support for the smooth implementation of the integration of industry-education projects.

4. Regarding the current situation of talent development in the integration of industry and education in Guangxi application-oriented universities, what kind of management strategies are suggested for talent development?

Regarding the current situation of talent cultivation in the integration of industry and education in Guangxi application-oriented universities, the following are some management strategy suggestions: to formulate multi-level and multi-discipline talent cultivation plans, including different levels of undergraduate students, postgraduate students and continuing education, etc., and cultivate applied talents adapted to the integration of industry and education according to the needs of industrial development and market demand for talents. Promote innovation in the curriculum system and teaching methods, focus on the cultivation of practical and application skills, strengthen the practical teaching links in the integration of industry, academia and research, and enhance students' industrial practice and innovation capabilities. Strengthen cooperation with industry and promote the integration of education and industry in the form of practical training and school-enterprise cooperation projects, so that students can better understand the actual needs of industry and grasp practical operating skills. Strengthen career planning and employment services for students, including career guidance and

internship and employment recommendation, to help students better integrate into the industrial sector and achieve a smooth transition in employment and career development.

Interviewee 6

1. Regarding the current situation of Teacher resources management in the integration of industry and education in Guangxi application-oriented universities, what management strategies are suggested for Teacher resources management?

Regarding the current situation of Teacher resources management in the integration of industry-education in Guangxi application-oriented universities, the following are some management strategies suggested: provide continuous teacher training, including the training of subject knowledge, teaching methods and practical experience, to improve the professionalism of teachers in the integration of industry-education. Set up a faculty incentive mechanism, such as providing performance incentives, title assessment and career development, in order to encourage teachers to actively participate in industry-education integration projects and to stimulate their creative energy. Strengthen the practical skills of the faculty and encourage teachers to go into practical scenarios such as enterprises and industries to enhance their industrial experience and practical skills. Strengthen the structural optimization of the faculty team and reasonably arrange the subject specialization background and practical experience of teachers to meet the needs of the integration of industry-education projects.

2. Regarding the current situation of financial management of the integration of industry and education in Guangxi application-oriented universities, what kind of management strategies are suggested in terms of financial management?

Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities, the following are some management strategy suggestions: establish a standardized financial management process, including budgeting, fund use and account management, to ensure the financial operation of the integration of education and industry project is compliant and transparent. Strengthen financial supervision and risk management, enhance the monitoring and

control of funds for the integration of education and industry projects, and prevent the occurrence of financial risks. Diversify funding sources, including government funds, corporate inputs and social donations, to reduce reliance on a single source of funding and improve the financial sustainability of the integration of education and industry projects. Regularly conduct the preparation and audit of financial statements to ensure the accuracy and timeliness of financial information and provide scientific basis for decision-making.

3. Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, what management strategies are suggested in terms of management mechanism?

Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, the following are some management strategy suggestions: to establish a clear management organization for the integration of education and industry, to clarify the responsibilities and powers of management departments at all levels, and to ensure the orderly implementation of the integration of education and industry. Strengthen internal and external cooperation and communication, and promote effective communication and collaboration between different departments within the university and between the university and external partners such as enterprises and the government, so as to form an integrated management model of industry-university-research-application. Set up a special management team for the integration of education and industry, responsible for the planning, organization and implementation, supervision and evaluation of the project.

4. Regarding the current situation of talent development in the integration of industry-education in Guangxi application-oriented universities, what kind of management strategies are suggested for talent development?

Regarding the current situation of talent cultivation in the integration of industry and education in Guangxi application-oriented universities, the following are some management strategy suggestions: to develop a talent cultivation program that meets the needs of integration of industry and education, including curriculum setting, practical

teaching, internship and training, etc., to cultivate students with practical ability and innovative and entrepreneurial spirit demanded by industry. Strengthen cooperation with industry and establish an industry-university-research talent development model, including industry mentors, enterprise training bases and industry-university-research projects, to provide practical work opportunities and hands-on exercises to improve students' industrial adaptability. Promote the integration of industry-education innovation and entrepreneurship education, including entrepreneurship courses, entrepreneurship practice and entrepreneurship mentors, to cultivate students' innovative thinking, teamwork and entrepreneurial management skills. Strengthen employment services and career planning guidance, providing students with career counselling, internship employment opportunities and career development guidance to promote smooth employment and provide high quality talents for industry.

Interviewee 7

1. What management strategies are suggested for the management of teachers in the integration of industry and education in Guangxi application-oriented universities?

Regarding the current situation of teacher resources management for the integration of industry-education in Guangxi application-oriented universities, the following are some suggested management strategies: Establish clear guidelines and criteria for teacher resources management, focusing on recruitment, selection and evaluation of relevant industrial experience, practical skills and teaching effectiveness. Provide professional development opportunities for faculty members to enhance their industrial knowledge and skills, such as industry-university collaboration programmes, industrial internships and continuing education programmes. Implement performance-driven incentives and rewards to motivate faculty and staff to actively participate in industry-related research, innovation and collaborative projects. Create a supportive and inclusive work environment that encourages open communication, teamwork and mutual learning between faculty and industry partners. Strengthen mechanisms for monitoring and evaluating the performance

of faculty and staff in the integration of industry and education, and provide feedback and support for improvement.

2. Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities, what kind of management strategies are suggested in terms of financial management?

The following are some suggested management strategies regarding the current status of financial management for the integration of education and industry in Guangxi's application-oriented universities: Develop a comprehensive financial plan that is aligned with the strategic goals and priorities of the integration and ensure sufficient financial resources are available to support related initiatives. Implement effective budget and financial control mechanisms to ensure transparent and accountable financial management practices. Strengthen the management and reporting of financial information in order to monitor the financial performance and use of expenditure on industry-education integration initiatives. Develop diversified financial resources, including industrial partnership funds, donations, and funds for research projects, to support the implementation of projects related to the integration of education and industry. Strengthen financial risk management, avoid and respond to factors that may pose financial risks to the integration of education and industry projects, and establish an emergency handling mechanism.

3. Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, what kind of management strategies are suggested in terms of management mechanism?

Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, the following are some management strategy suggestions in terms of management mechanism: establish a clear management institution and organizational structure for the integration of education and industry, clarify the responsibilities and authority of management at all levels, and ensure the efficient operation of the integration of education and industry. Implement information management, establish an information platform for the integration of industry-

education, realise information sharing and optimisation of business processes, and improve management efficiency and the scientific nature of decision-making. Strengthen the standardised management of University-Industry Cooperation, including the signing and fulfillment of cooperation contracts, the management of intellectual property rights, and the promotion of the transformation of results, to ensure the legal and compliant operation of University-Industry Cooperation. Strengthen the supervision and evaluation of the work of University-Industry Integration, establish a performance evaluation system, regularly evaluate and give feedback on the work of University-Industry Integration, discover problems and correct them in time, and continuously improve the management mechanism.

4. Regarding the current situation of talent development in the integration of industry and education in Guangxi application-oriented universities, what kind of management strategies are suggested for talent development?

Regarding the current situation of talent cultivation in the integration of industry and education in Guangxi application-oriented universities, the following are some management strategy suggestions for talent cultivation: to set up clear talent cultivation goals and cultivation plans, including practical aspects of integration of industry-university-research, participation in practical projects and cultivation of practical skills, etc., so as to ensure the cultivation of applied talents that meet industrial demands. Promote the deep connection between teaching and industrial needs, establish an industry-oriented curriculum system, integrate industrial practice into course teaching, and improve students' practical application ability and industrial adaptability. Strengthen the teaching capacity of teachers, including providing education and teaching training and curriculum design support, encouraging teachers to participate in industry-university research projects, and enhancing their level of teaching integration between industry, university and research. Strengthen cooperation with enterprises and establish a cooperation mechanism for the training of talents from industry-university-research, including the construction of enterprise practice bases, guidance from enterprise mentors and industrial skills certification, to improve students' practical working ability and employability.

Interviewee 8

1. Regarding the current situation of Teacher resources management in the integration of industry-education in Guangxi application-oriented universities, what management strategies are suggested for Teacher resources management?

Regarding the current situation of Teacher resources management in the integration of industry and education in Guangxi application-oriented universities, the following are some management strategy suggestions: expand the sources of teachers, including introducing excellent external professionals and encouraging internal teachers to participate in the integration of industry and education projects, so as to enrich the teacher team. Strengthen teacher training, including training in education and teaching methods, practical skills and industrial knowledge, to enhance teachers' ability to integrate industry and education. Formulate clear teacher incentive policies, including salary incentives, title assessment and project sharing, to encourage teachers to participate in industry-education integration and achieve tangible results. Strengthen the management of the faculty, including regular evaluation and performance assessment, and make comprehensive evaluation of teachers' teaching, scientific research and the work of integration of industry and education, so as to provide a basis for the optimization and improvement of the faculty.

2. Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities, what kind of management strategies are suggested in terms of financial management?

Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities, the following are some management strategy suggestions: establish a sound financial management system, including project budget, fund use and financial report, to ensure the financial compliance and transparency of the integration of education and industry projects. Set up a dedicated financial management team to be responsible for the financial planning, accounting and supervision of the project, so as to enhance the professionalism and efficiency of financial

management. Strengthen financial supervision and risk management, including strict management of project funds, risk assessment and preventive measures, to ensure the financial security of the integration of education and industry projects. Promote diversified sources of funds, including government funds, enterprise input and social donations, to mitigate the risks of a single source of funds and guarantee the sustainable development of the project.

3. Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, what kind of management strategies are suggested in terms of management mechanism?

Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, the following are some management strategy suggestions: establish a clear management institution and organizational structure for the integration of education and industry, and clarify the responsibilities and authority of management at all levels to ensure the efficient operation of the integration of education and industry. Implement information management, establish an information platform for the integration of industry-education, realise information sharing and optimisation of business processes, and improve management efficiency and the scientific nature of decision-making. Reinforce the standardisation and institutionalisation of University-Industry Cooperation, including the signing of cooperation agreements, project management and distribution of results, to ensure fair, just and sustainable development of cooperation. Strengthen the supervision and evaluation of industry-education integration projects, establish a performance evaluation mechanism, regularly assess the progress and effectiveness of projects, and promptly adjust management strategies and improve working models. Improve the management system of the integration of industry-education, including organizational structure, division of responsibilities and process specification, etc., and clarify the responsibilities and rights of various departments and personnel in the integration of industry-education.

4. Regarding the current situation of talent cultivation in the integration of industry and education in Guangxi application-oriented universities, what kind of management strategies are suggested for talent cultivation?

Regarding the current situation of talent cultivation in the integration of industry-education in Guangxi application-oriented universities, the following are some management strategies suggested: to formulate talent cultivation plan and curriculum system that meet the needs of integration of industry-education, and cultivate high-level applied talents with practical ability, innovation spirit and industrial literacy. Implement a teaching mode that integrates industry and education, including practical training, internship and practice in cooperation with schools and enterprises to enhance students' practical skills and industrial adaptability. Strengthen the cultivation of students' practical and innovative abilities, including participation in research projects and innovation and entrepreneurship education, to enhance students' research capabilities and innovation awareness. Strengthen cooperation with industry and establish a mechanism for training talents from industry, university and research, including joint training and internship and employment, etc., to enhance students' employment competitiveness and practical operation ability. Strengthen students' career planning and employment services, and provide support such as career guidance and career selection counselling to help students better integrate into the industrial sector and society.

Interviewee 9

1. Regarding the current situation of Teacher resources management in the integration of industry and education in Guangxi application-oriented universities, what management strategies are suggested for Teacher resources management?

Regarding the current situation of teacher resources management in the integration of industry and education in Guangxi application-oriented universities, the following are some management strategy suggestions: improve the overall quality of the faculty: improve the overall quality of the faculty by introducing high-level teachers, training and Development the education and teaching ability of existing teachers to meet the needs

of the integration of industry and education. Strengthen the incentive mechanism for teachers: Establish a scientific and reasonable incentive mechanism, including remuneration, title assessment and research support, in order to attract and motivate outstanding teachers to participate in the integration of industry-education work. Promote faculty team building: Encourage teachers to form teams to carry out collaborative research and teaching across disciplines and fields to promote knowledge exchange and innovation. Strengthen teacher training: carry out regular teacher training to improve teachers' concepts, business level and practical ability in the integration of industry and education, and promote the continuous development and improvement of the teacher team.

2. Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities, what kind of management strategies are suggested in terms of financial management?

Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities, the following are some management strategy suggestions: establish a sound financial management system: formulate clear financial management policies and processes, standardize the use of funds, reporting and approval processes of the integration of education and industry projects, and ensure the use of funds in a compliant and legal manner. Strengthen financial monitoring and risk management: Establish a financial monitoring mechanism, regularly inspect and evaluate the financial situation of the integration of education and industry projects, and identify and resolve potential financial risks in a timely manner. Broaden the sources of funding: actively seek multi-channel funding support such as government support, corporate donations and social donations to reduce financial pressure and ensure the sustainable development of the integration project. Improve the efficiency of using funds: plan and use the funds of the integration of education and production projects reasonably, strengthen cost control and performance evaluation, and improve the efficiency of using funds.

3. Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, what kind of management strategies are suggested in terms of management mechanism?

Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, the following are some management strategy suggestions: strengthen the standardized management of the cooperation between education and industry, establish clear cooperation agreements and contracts, clarify the cooperation content, rights and responsibilities and benefit distribution, and ensure the cooperation relationship is fair, legal and sustainable. Strengthen the supervision and evaluation of industry-university-research cooperation projects, establish a project management and evaluation system, and conduct regular monitoring and evaluation of cooperation projects to identify and solve problems in a timely manner, so as to ensure the smooth promotion and effective achievement of the projects. Establish an intellectual property management system for University-Industry Research Cooperation, including patent application, technology transfer and commercialisation, to reasonably protect and utilise intellectual property rights and maximise the industrialisation and economic benefits of the results of University-Industry Research Cooperation. Strengthen the publicity and promotion of University-Industry-Research Cooperation, improve the visibility and influence of the cooperation projects, attract more outstanding enterprises and institutions to participate in the cooperation, and promote the expansion of University-Industry-Research Cooperation to a wider field.

4. Regarding the current situation of talent development in the integration of industry-education in Guangxi application-oriented universities, what kind of management strategies are suggested for talent development?

Regarding the current situation of talent cultivation in the integration of industry-education in Guangxi application-oriented universities, the following are some management strategy suggestions: set up a multi-level and multi-discipline talent cultivation system, including undergraduate, postgraduate and continuing education, to meet the different talent needs of the integration of industry-education. Strengthen

practical teaching, enhance the construction and utilisation of industry-academia-research practice bases, provide training opportunities for practical projects and actual positions, and cultivate talents with practical operational skills and the ability to solve practical problems. Strengthen interdisciplinary and professional integration, promote the deep integration of industry-university-research, and cultivate interdisciplinary and comprehensive talents with strong comprehensive qualities to adapt to the diversification and complexity of industrial development. Set up talent incentive policies, such as establishing a reward system for industry-university-research talents and internship and practical training allowances, to stimulate students' enthusiasm and creativity in participating in the integration of industry and education. Strengthen cooperation with enterprises and industries, provide internship, practical training, employment and entrepreneurship support, and establish a long-term mechanism for training talents in industry-university research to achieve effective output of talents and maximize social value.

Interviewee 10

1. In view of the current situation of teacher resources management in the integration of industry and education in Guangxi application-oriented universities, what management strategies are proposed for teacher resources management?

In view of the current situation of teacher resources management in the integration of industry and education in Guangxi application-oriented universities, the following management strategies are proposed: establish a two-way flow mechanism of talents between schools and enterprises, provide guarantee measures to promote two-way flow of talents, which is conducive to mutual understanding between schools and enterprises and form a good basis for in-depth collaboration and common growth of talent team between industry and education. Call on the education authorities to relax the restrictions on the management and identification of university teachers, and strengthen the autonomy and flexibility of joint faculty construction between universities and enterprises. Establish a multi-dimensional assessment and evaluation of talents jointly participated by

both schools and enterprises, and give necessary support in terms of achievement recognition, title evaluation, performance assessment and personal honor.

2. In view of the current situation of financial management of the integration of production and education in Guangxi application-oriented universities, what kind of management strategy is recommended in financial management?

In view of the current situation of financial management of the integration of production and education in Guangxi application-oriented universities, the following management strategies are suggested: broaden the fund source channels of the integration of production and education, set up special funds to ensure the investment. Strengthen the standardization of financial management process of the integration of production and education, organize relevant personnel to study, plan and prepare the budget for the integration of production and education scientifically, and use it reasonably. Strengthen the process management to ensure the and reasonable compliance of fund use.

3. In view of the current situation of the management mechanism of the integration of production and education in Guangxi application-oriented universities, what kind of management strategy is recommended in terms of management mechanism?

In view of the current situation of the management mechanism of the integration of industry and education in Guangxi application-oriented universities, the following management strategies are suggested: sort out the division of responsibilities of application-oriented universities about the work of integration of industry and education, clarify the responsibility and power of internal units, improve the awareness of phase service and improve the efficiency of collaboration. Strengthen the research, analysis and study of the case of integration of production and education, form the research atmosphere of integration of production and education, and improve the scientific and effective management mechanism. Establish an incentive mechanism for the integration of industry and education, and incorporate relevant work into the work points and performance assessment of the school. Strengthen the contact and communication with enterprises, research the actual needs of enterprises, and form an atmosphere of mutual

help. Call on the local government to strengthen guidance and introduce policies to promote the development of integration of industry and education jointly with science and technology, education, industry and information technology departments to cultivate the atmosphere of integration of industry and education and collaborative innovation.

4. What management strategies are proposed for talent cultivation in Guangxi application-oriented universities with regard to the current situation of talent cultivation in the integration of industry and education?

In view of the current situation of talent cultivation of Guangxi application-oriented universities with integration of production and education, the following management strategies are proposed: increase the participation of enterprises in talent cultivation of application-oriented universities, let enterprises deeply participate in talent cultivation orientation, curriculum setting, teaching practice, innovation and entrepreneurship, curriculum resource construction and assessment and evaluation, and participate in the iterative update of talent cultivation program in the closed loop of talent cultivation, and let enterprise managers realize that enterprises are also one of the subjects of talent cultivation, and also the beneficiaries of talent cultivation. Strengthen students' understanding and awareness of enterprises, help students establish career concepts, do career planning, improve students' purpose and initiative of learning, and school and enterprise jointly guide and counsel students to use their professional knowledge to solve practical problems and improve their practical hands-on ability and comprehensive ability.

By analyzing the level of the strategies of Development industry-education integration in Guangxi Application-oriented Universities, according to the second part of the questionnaire, it is known that industry-education integration in Guangxi Application-oriented Universities need to be improved further in terms of 1) Teacher resources management, 2) Financial Management, 3) Management Mechanism and 4) Talent Development. On the basis of the third part of the interview, this study carried out strategies for Development industry-education integration in Guangxi Application-oriented Universities, including 4 strategies, a total of 20 measures: 1) 5 measures to improving teacher resource management; 2) 5 measures to supporting financial management; 3) 5

measures to promoting management mechanism; 4) 5 measures to promoting talent development.

Table 4.8 Strategies for Development industry-education integration of Application-oriented Universities in Guangxi

Strategies	measures
Improving teacher resources management	Develop an effective management model for the training of teachers in the integration of industry and education Formulate policies for the development of teachers for the integration of industry and education Plan teacher resources and personnel allocation in a scientific and reasonable manner Improve teacher training system and guide teachers to develop career planning Establish a scientific teacher evaluation system and link it to performance appraisal and title evaluation
Supporting financial management	Improve the financial management system and regulate the use of funds for the integration of education and industry projects Introduce diversified funding sources to improve the financial sustainability of the integration of industry-education projects Set up special funds for integration of industry-education to guarantee financial investment Strengthen financial training for managers and cultivate financial decision-making ability Strengthen financial supervision and risk management to ensure the financial security of the integration of education and industry projects

Table 4.8 Strategies for Development industry-education integration of Application-oriented Universities in Guangxi

Strategies	measures
promoting management mechanism	Establishing a sound management mechanism for the integration of industry and education Establish a clear organizational structure and management system Appoint people with enterprise management experience as managers of the integration of industry and education Strengthen the standardized management of cooperative projects and clarify the distribution of rights and interests between the two parties involved in cooperative projects Establish a scientific and reasonable performance evaluation and incentive mechanism to stimulate the enthusiasm of participants
promoting talent development	Establishing a scientific talent development model for the integration of industry and education Establish a curriculum system of integration of industry and education Provide necessary conditions for students' internship in enterprises to improve their practical ability Build a teaching resource library with enterprises Strengthen students' career planning and employment services

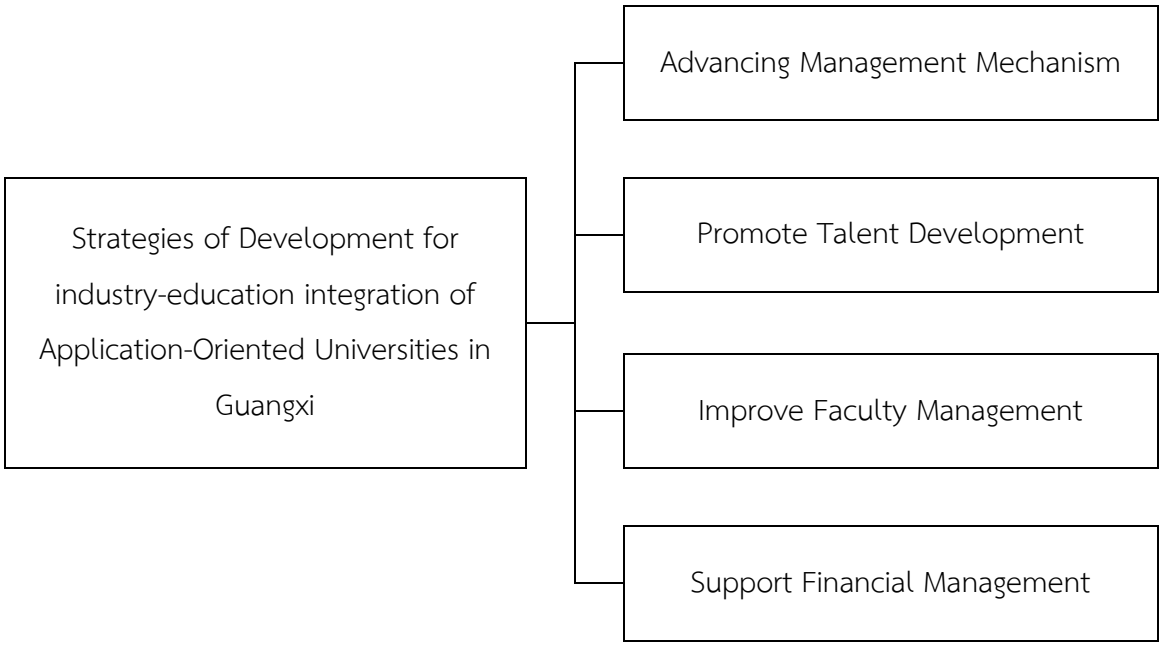

Figure 4.1 Strategies of Development for industry-education integration of Application-Oriented Universities in Guangxi

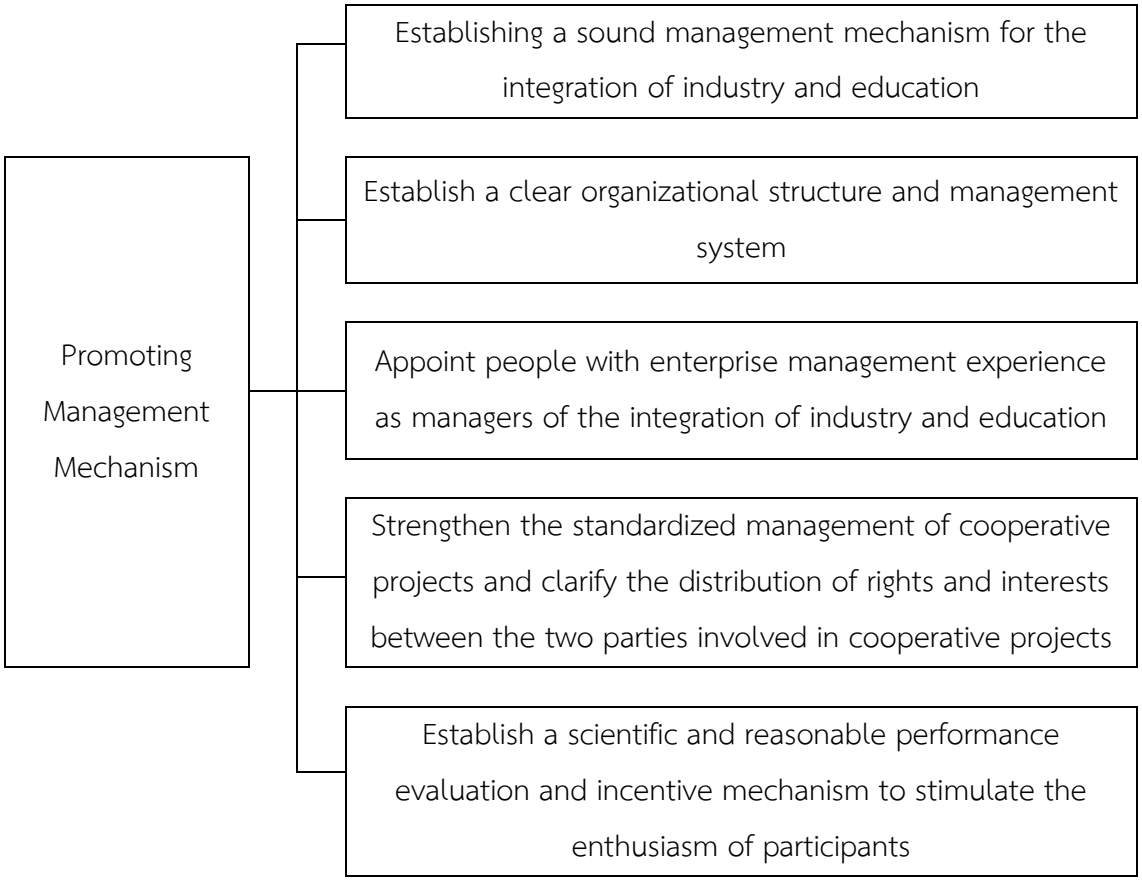

Figure 4.2 The Strategies for promoting management mechanism

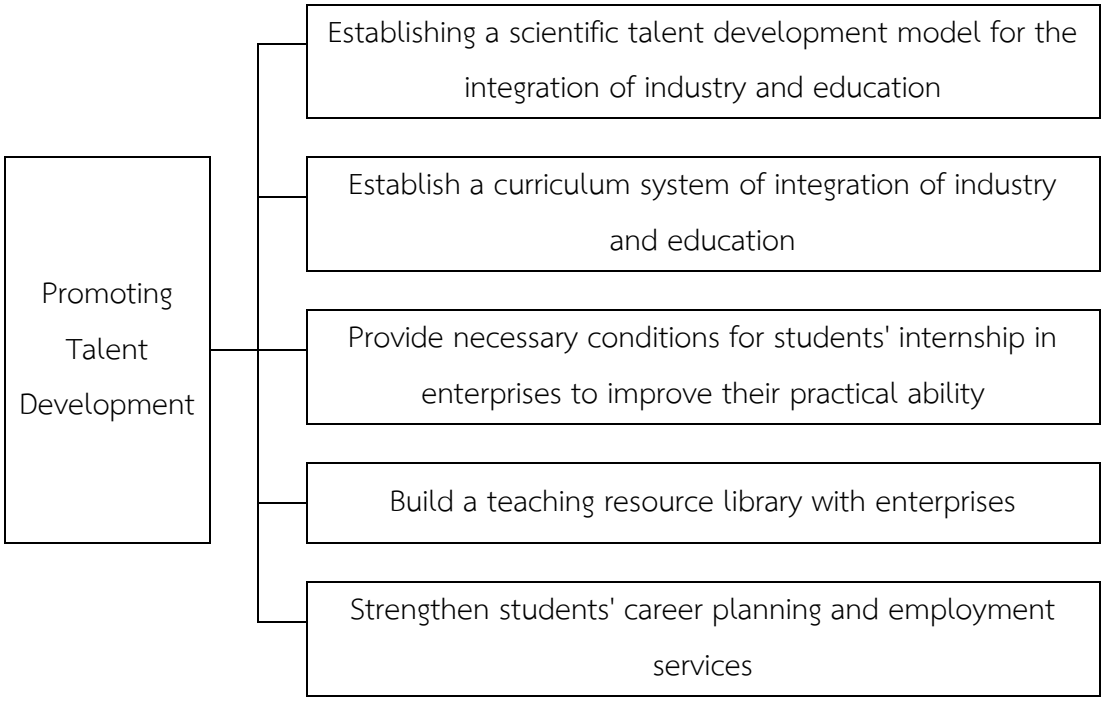

Figure 4.3 The Strategy of promoting talent development

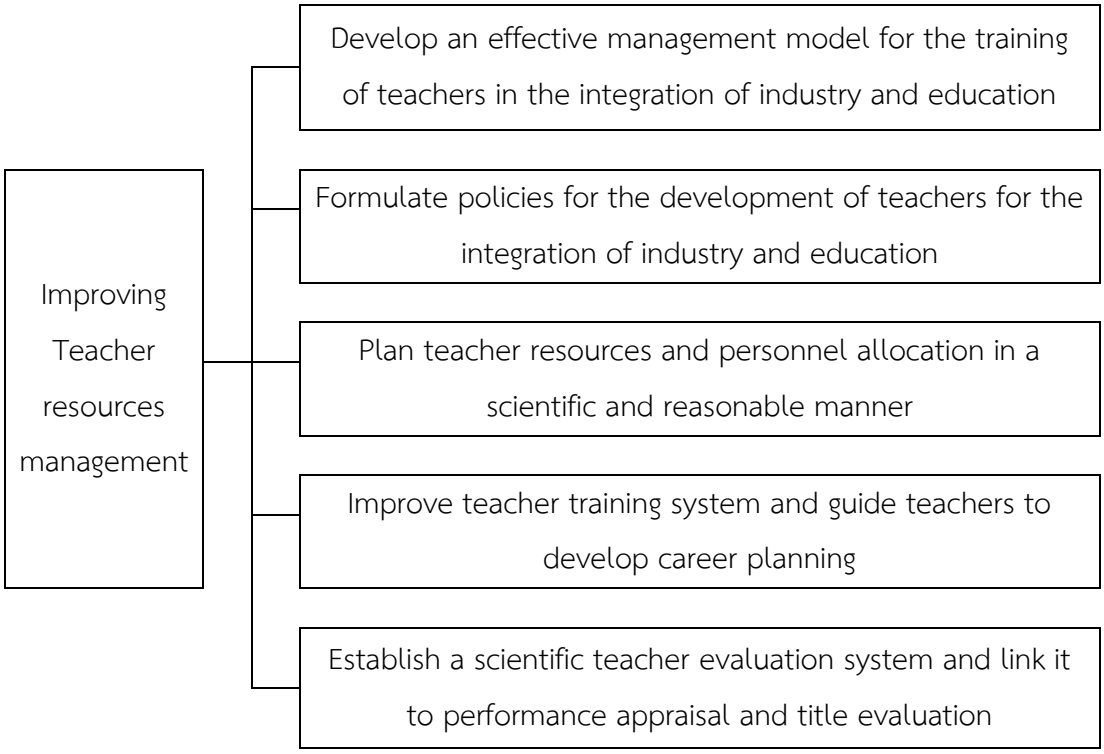

Figure 4.4 The Strategy of Improving teacher resources management

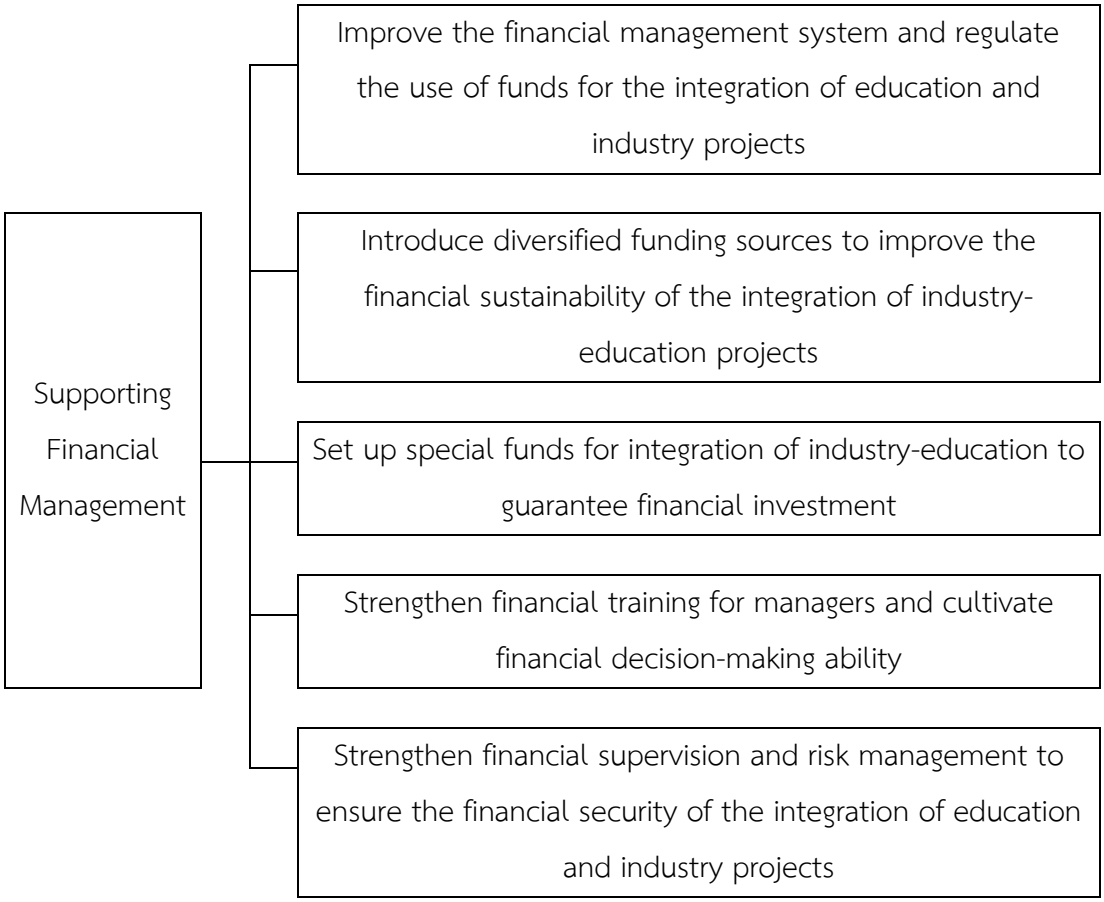

Figure 4.5 The Strategy of supporting financial management

Part 4: Adaptability and Feasibility evaluation results of the implementation of strategies for Development industry-education integration in Guangxi Application-oriented Universities.

The analysis results at this stage led by experts and scholars studying higher education in Guangxi Application-oriented Universities. Five people evaluated the adaptability and feasibility of implementing the strategy. They adopted the form of a 5-level scoring table, namely, highest, high, average, low, and lowest. A respondents can only choose one level. The results are shown in the following table:

Table 4.9 Average and standard deviation of expert evaluation strategies for development industry-education integration of application-oriented universities in Guangxi

Strategies	adaptability		Level	Feasibility		Level
	$\overline{X}$	S.D.		$\overline{X}$	S.D.	
improving teacher resources management	4.56	0.51	highest	4.36	0.70	high
supporting financial management	4.28	0.54	high	4.24	0.72	high
promoting management mechanism	4.60	0.50	highest	4.56	0.58	highest
promoting talent development	4.48	0.51	high	4.40	0.50	high
Total	**4.48**	**0.52**	**high**	**4.39**	**0.63**	**high**

Table 4.10 Average and standard deviation of expert evaluation strategies for development industry-education integration of application-oriented universities in Guangxi

Strategies and measures	adaptability		Level	Feasibility		Level
	$\overline{X}$	S.D.		$\overline{X}$	S.D.	
Improving teacher resources management						
1. Develop an effective management model for the joint cultivation of teachers between universities and enterprises.	4.40	0.55	high	4.60	0.55	highest
2. Formulate clear policies for managing the integration of industry and education in teacher development.	4.40	0.55	high	4.00	1.00	high
3. Plan teacher resources and personnel allocation in a scientific and rational manner.	4.60	0.55	highest	4.80	0.45	highest
4.Establish a sound system for teacher training, guiding teachers to develop career growth plans.	4.60	0.55	highest	4.20	0.45	high
5. Establish a scientific system for teacher evaluation, and link it to performance appraisals and professional title evaluations.	4.80	0.45	highest	4.20	0.84	high
Supporting financial management						
1. Establish and improve financial management systems to regulate the use of funds for industry-education integration projects.	4.20	0.45	high	4.20	0.84	high
2. Introduce diversified sources of funding to improve the financial sustainability of industry-education integration projects.	4.60	0.55	highest	4.00	1.00	high

Table 4.10 Average and standard deviation of expert evaluation strategies for development industry-education integration of application-oriented universities in Guangxi (continue)

Strategies and measures	adaptability		Level	Feasibility		Level
	$\overline{X}$	S.D.		$\overline{X}$	S.D.	
3. Set up special funds for industry-education integration to guarantee financial input.	4.20	0.45	high	4.00	0.71	high
4. Strengthen financial training for managers and develop their financial decision-making ability.	4.20	0.45	high	4.60	0.55	highest
5. Strengthen financial supervision and risk management to ensure the financial security of industry-education integration projects.	4.20	0.84	high	4.40	0.55	high
Promoting management mechanism						
1. Develop a sound management mechanism for the integration of industry and education.	4.80	0.45	highest	4.60	0.55	highest
2. Establish a clear organizational structure and management system for the integration of industry and education.	4.60	0.55	highest	4.60	0.55	highest
3. Appoint individuals with experience in enterprise management as education managers for the integration of industry and education.	4.40	0.55	high	4.60	0.55	highest
4. Strengthen the standardized management of cooperative projects and clarify the distribution of rights and benefits of both schools and enterprises involved in the cooperative project.	4.60	0.55	highest	4.20	0.84	high
5. Establish a scientific and reasonable performance evaluation and incentive	4.60	0.55	highest	4.80	0.45	highest

Table 4.10 Average and standard deviation of expert evaluation strategies for development industry-education integration of application-oriented universities in Guangxi (continue)

Strategies and measures	adaptability		Level	Feasibility		Level
	$\overline{X}$	S.D.		$\overline{X}$	S.D.	
mechanism to stimulate the enthusiasm of participants.						
Promoting talent development						
1. Establish a scientific talent cultivation model for industry-university collaboration.	4.40	0.55	high	4.60	0.55	highest
2. Establish a curriculum system for industry-university collaboration.	4.60	0.55	highest	4.20	0.45	high
3. Provide necessary conditions for students to intern in enterprises and improve their practical abilities.	4.20	0.45	high	4.60	0.55	highest
4. Co-build teaching resource libraries with enterprises.	4.80	0.45	highest	4.20	0.45	high
5. Strengthen students' career planning and employment services.	4.40	0.55	high	4.40	0.55	high
Total	**4.48**	**0.52**	**high**	**4.39**	**0.63**	**high**

The results of the data analysis show that the adaptability and feasibility of 20 measures in 4 strategies are at a high level in the development strategy of the integration of industry-education in Guangxi application-oriented universities.

Chapter 5

Conclusion Discussion and Recommendations

The aims of the present study include 1) to analyze the level of industry-education integration of Application-oriented Universities in Guangxi, 2) to develop strategies of development for industry-education integration of Application-oriented Universities in Guangxi, 3) to evaluate the strategies of development of industry-education integration of Application-oriented Universities in Guangxi. In order to solve the problems mentioned in Chapter 1 and achieve the above research objectives, the researchers adopted the following research findings, as follows:

Conclusion

The purpose of this study was to explore the management strategy of Guangxi application-oriented universities based on the integration of industry and education, as well as to assess the adaptability and feasibility of the model. Through investigation and analysis, the following conclusions were drawn:

The purpose of this study is to explore the management strategies of Guangxi application-oriented universities based on the integration of industry and education, as well as to assess the applicability of the model. Through investigation and analysis, the following conclusions are drawn:

1. in terms of teacher resources management, the current situation of Guangxi application-oriented universities scores medium level, among which, "managers have human resource management ability", "universities have perfect teacher resources management mechanism" score relatively high, " The scores of "the management mode of training teachers with enterprises", "the growth mechanism of teachers with enterprise practice" and "the teachers of universities have enterprise working experience" are lower. It shows that the administrators of Guangxi application-oriented universities have human

resource ability and have basically established teacher resources management system, but the current teacher resources management system still needs to be strengthened in terms of its relevance and adaptability to the "integration of education and industry". Teachers have less working experience in enterprises, teachers' training is disconnected from industry, teachers lack business ability of integration of industry and education to a certain extent, and teachers' enthusiasm to participate in integration of industry and education is not high, which means that the university lacks scientific evaluation system and incentive mechanism for teachers' participation in integration of industry and education, and the management mode of joint training of teachers between universities and enterprises and the growth mechanism of teachers' practice and exercise in enterprises need to be strengthened in terms of reasonableness and effectiveness.

2. In terms of financial management, the current situation of Guangxi application-oriented universities scores medium level, among which "effective management and use of funds" and "scientific financial decision-making ability of university managers" have higher scores, and "the financial management system of university integration" has higher scores. The scores of "fund management system in the integration of education and industry" and "universities can increase the value of enterprise wealth" are lower. It indicates that the managers of Guangxi application-oriented universities have scientific financial decision-making ability and have generally established effective financial management system, but the financial management system still needs to be strengthened for the "integration of education and industry", and it has not been able to help enterprises increase their income. In addition, in the indicator of "adequate financial investment in the integration of education and industry", public universities generally invest more in the integration of education and industry than private universities because of the government financial support.

3. In terms of management mechanism, the current situation of Guangxi application-oriented universities scores medium level, among which "mutual appointment system between university managers and senior managers of enterprises" and "management mode of integration between universities and enterprises" have higher scores. The scores of

"universities have perfect management mechanism for integration of education and industry" and "people with rich experience in enterprise management work as education managers for integration of education and industry" are low. The survey found that Guangxi application-oriented universities generally have the management mode of integration of education and industry in universities, and have established mutual appointment system with enterprises. However, many universities have not formed an effective, systematic and perfect management mechanism for the integration of education and industry, and the management institutions and organizational structure of the integration of education and industry in some universities are not clear enough. Many university managers responsible for the integration of industry-education lack experience in enterprise management, and the managers do not know enough about the operation and needs of enterprises.

4. In terms of talent cultivation, the current situation of Guangxi application-oriented universities scores medium level, among which "universities and enterprises jointly carry out professional skills certification" and "universities and enterprises jointly construct talent cultivation mechanism" score high, and "universities and enterprises have scientific training mechanism for integration of industry and education" scores high. The scores of "having scientific talent cultivation mode of integration of production and education" and "universities and enterprises jointly constructing teaching resource base" are lower. The survey finds that each application-oriented university in Guangxi has a high recognition of its own talent cultivation, and generally constructs a talent cultivation mechanism with enterprises and carries out professional skills certification. However, the talent cultivation mode of the integration of industry and education is not yet able to respond well to the needs of local industrial development, and there is still much room for improvement in terms of scientific and systematization. The curriculum system of industry-education integration is not perfect, and some teaching resources conditions are lacking, which affects the cultivation effect of applied talents.

Through the research of this topic, we have a better understanding of the current situation of industry-education integration in Guangxi application-oriented universities, which is of medium level. Among the factors affecting the integration of industry-education

in Guangxi application-oriented universities, the following factors are listed in order of score: management mechanism, talent cultivation, teacher resources management and financial management, but the scores of each factor are relatively close. Combined with the interviews, the researcher proposed 20 strategies in 4 areas. Through the analysis of the effectiveness and feasibility of the strategies proposed in this study, it was found that the effectiveness and feasibility of the strategies were at a high level.

Discussion

1. Exploring the teacher resources management of industry-teaching integration in Guangxi application-oriented universities

The research results show that the integration of industry-education in Guangxi application-oriented universities is at a medium level in terms of teacher resources management, which requires universities and enterprises to establish a joint training mechanism, improve the training system of teachers for integration of industry-education, and encourage teachers to go to enterprises for attachment and project practice. This is consistent with the results of some studies. For example, accelerating the implementation of "double-teacher" teacher recognition standards, implementing the vocational school teacher education upgrading plan, promoting the integrated training of vocational teachers, strengthening the construction of "double-teacher" teacher training system, and strengthening the construction of part-time teachers (Cao Ye, Meng Qingguo. 2023); suggesting to enrich the enterprise work experience of vocational education teachers in the pre-service stage, establish a regular mechanism for teachers' enterprise practice, and actively cultivate teachers' awareness of professional development (Hao, T. C. 2021); reshaping a new concept of teachers' cross-border development based on the cultivation of new engineering talents; creating a new system of teacher development training based on the whole life cycle; constructing a new structure of teacher training courses

highlighting the quality improvement of teachers' core competencies; building a new curriculum of industry-education New curriculum structure; building a new platform for collaborative education between schools and enterprises with deep integration of industry and education; improving a new mechanism for teaching evaluation and incentive to guarantee the construction of first-class undergraduate education (Jiang Aihua et al. 2019). If these problems are not solved, they may have a deep impact on the goals and motivation of teachers' participation in the work of integration of industry and education, thus causing problems at the level of implementation of integration of industry and education. Therefore, middle managers of the integration of industry-education in Guangxi application-oriented universities need to strengthen the exploration and application of specific practices and methods in this area in order to better reflect the level of teacher resources management and bring into play the subjective initiative of teachers to meet future challenges. This can be achieved by strengthening the training, growth planning and teacher resources management support for the teachers involved.

2. Exploring the financial management of industry-education integration in Guangxi application-oriented universities

The research results show that the integration of industry-education in Guangxi application-oriented universities is at a medium level in terms of financial management. It indicates that Guangxi application-oriented universities need further improvement in this aspect, and need the government, universities and enterprises to work together to improve the policy and legal guarantee mechanism, promote diversified capital investment, scientifically measure the input and income, and clarify the relationship between rights and interests to create a scientific and effective financial guarantee system. Scientific and reasonable measurement of enterprises' resource input in the process of participating in education; fourth, accelerate the refinement and implementation of the

combined incentive policy (Yang Guangjun, Zhou Fenghua.2020); the government needs to improve the policy guarantee mechanism, establish the funding guarantee mechanism, and build the legal guarantee mechanism (Zhang Tingting.2019); build the interest adjustment mechanism of diversified subjects in group schooling, and suggest that the financial special funds invested by the central public finance as the main, establish the incentive mechanism of enterprise input and compensation mechanism of profit and loss, realize the responsibility sharing and resource sharing of school running group, and ensure the real realization of grouping in vocational education (Pan Nianping. 2017). This indicates that the results of this study results are consistent with previous studies that emphasize the importance of adequate financial investment and sound guarantee system, and clear equity relationship for the financial management of industry-education integration in Guangxi application-oriented universities. In addition, the government should be called upon to increase the financial investment in the integration of industry and education in private universities.

3. Exploring the management mechanism of the integration of industry and education in Guangxi application-oriented universities

The research results show that the integration of industry-education in Guangxi application-oriented universities is at a medium level in terms of management mechanism, and it needs to improve the management mechanism of integration of industry-education, stimulate scientific and reasonable performance evaluation and incentive mechanism, and stimulate the enthusiasm of participants. This is basically consistent with the following research results: constructing a sustained endogenous motivation mechanism, a pluralistic core operation mechanism, and a reasonable and effective evaluation mechanism to promote the value realization and harmonious win-win situation of each interest subject (Chi, Chunyang.2021). Establishing a sound relevant system and strengthening the guiding

role of assessment and incentive on the construction of the integration platform of industry-education (Yang Mei, Wang Ying, Zhou Zhengzhu.2021) To build a mutually beneficial and win-win demand-driven mechanism, a resource allocation mechanism for sharing and common prosperity, a standardized and effective dynamic coordination mechanism, a scientific and reasonable performance evaluation mechanism, and a synergistic mechanism with the deep participation of industry organizations (Xu Chang, Xie Xudong.2018). To improve the management effectiveness of industry-education integration in Guangxi application-oriented universities, we should also strengthen the mechanism innovation of industry-education integration in application-oriented universities and create a synergistic mechanism of industry-education integration.

4. Exploring the talent cultivation of the integration of industry and education in Guangxi application-oriented universities

The research results show that the integration of industry-education in Guangxi application-oriented universities is at a medium level in terms of talent cultivation. It is necessary to position the talent cultivation in close connection with the regional industrial resources and employment demand, create the talent cultivation mode and curriculum system of the integration of industry and education, and reform the evaluation system of talent cultivation. This is in line with the following research: to build a school-enterprise cooperation platform, to closely match the regional industry, and to build a model of training highly skilled talents that "sets majors in line with industry, sets standards in line with jobs, constructs curriculum in line with tasks, and implements teaching in line with evaluation" (Yang GQ, Zhu W, Lu WG. 2021). With the integration of industry and education, school-enterprise cooperation as the entry point, coupling the talent development objectives, specifications and talent development quality assessment mechanism of vocational universities, the reform of curriculum system and teaching content as the

starting point, based on the theory of competence-based and vocational ability development stage theory, the practical innovation platform of school-enterprise cooperation, and the establishment of the double helix talent development model (Zou Yuxiang. 2021).

Recommendations

1. In terms of teacher resources management, the survey results show that the lowest score is "having the management mode of joint training of faculty by universities and enterprises". This indicates that Guangxi application-oriented universities need to be strengthened in this aspect. Therefore, the researchers put forward the following suggestions: 1) universities and enterprises should conduct thorough research and scientific proof to establish an effective management mode for joint training of teachers; 2) promote mutual posting and training of personnel from both sides and provide relevant support and assistance for mutual mobility of personnel, helping teachers to improve their application practice; 3) organize business learning activities for personnel from both sides, complementing business shortcomings; 4) develop a teacher evaluation system and growth mechanism, with joint teacher evaluations by both schools and enterprises, and link the evaluation results to teacher title evaluation and position promotion to increase the motivation of the staff concerned.

2. In terms of financial management, the survey results show that the lowest score is "the financial management system of universities in the integration of education and industry". This indicates that Guangxi application-oriented universities have basically established a financial management system for the integration of education and industry, but the feasibility and effectiveness of the system still need to be strengthened. Therefore, the researcher suggests that: 1) each university conducts research to relevant personnel

involved in the work of integration of education and industry to improve the fund management system of integration of education and industry, ensure the dedicated use of special funds and promote a financial management system adapted to the integration of industry and education; 2) Strengthen the management and reporting of financial information and improve the internal audit system in order to monitor the financial performance and use of expenditure of the industry-education integration initiative; 3) Establish a standardised financial management process, and improve the training and learning of relevant personnel to enhance the standardisation of financial management.

3. In terms of management mechanism, the survey results show that the lowest score is "universities have a sound management mechanism for the integration of education and industry". This indicates that Guangxi application-oriented universities have basically established the management mechanism for the integration of education and industry, but the degree of perfection of the management mechanism needs to be further strengthened. Therefore, the researchers suggest: 1) Establish a performance evaluation system for the industry-education integration, strengthen the process management, and jointly carry out performance evaluation by the university and enterprises, and link the performance evaluation with the performance salary of the teaching units, meanwhile, strengthen the publicity and guidance to form a benchmarking effect; 2) Strengthen the management of intellectual property rights of the industry-education integration projects, clarify the ownership of the intellectual property rights and interests of the university and enterprises, form a system related to the transformation and management of intellectual property rights, and promote the transformation of achievements.

4. In terms of talent cultivation, the survey results show that the lowest score is "having a scientific talent cultivation model for the integration of industry and education". This indicates that the talent cultivation of Guangxi's application-oriented universities has

been effective to a certain extent, but the scientific nature still needs to be strengthened. Therefore, the researchers suggest that 1) Develop multi-level and multi-disciplinary talent cultivation plans, integrate industry and education to further ensure the accuracy and effectiveness of talent cultivation; 2) Cultivate applied talents that meet the needs of regional industry development according to the needs of industry development and the market demand for talents, promote the effective connection between industry and talent chains, and provide strong support for regional industry development; 3) Pay attention to the cultivation of students' industrial awareness and vocational quality, strengthen the education of students' understanding of internship and guidance of career development planning, and help students establish a correct career concept..

Future Researches

After the research work of this project, I deeply understand the current situation of industry-education integration in Guangxi application-oriented universities, and put forward the management strategy of industry-education integration in Guangxi application-oriented universities in four aspects: teacher resources management, financial management, management mechanism and talent cultivation. This research has accumulated a good foundation, and also found some of my shortcomings in the research. I hope to make up for my shortcomings in the future, based on my own work situation, and continue to do more in-depth research along the direction of the integration of industry-education talent development in application-oriented universities, so as to make more breakthroughs and provide more references for the development of application-oriented universities in Guangxi.

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Appendixes

Appendix A

List of Specialists and Letters of Specialists Invitation for IOC Verification

List of Specialists and Letters of Specialists Invitation for IOC Verification

Serial number	Name (Title)	The Sample Group
1	Professor Dr. Fen Wang	Guangxi University of Science and Technology
2	Professor Dr. Lei Yuan	Guangxi Normal University
3	Professor Dr. Wang Min	Liuzhou City Vocational College
4	Professor Dr. Ting Zhang	College of Guangxi University for Nationalities
5	Professor Dr. Liu Kai	Liuzhou Institute of Technology

Appendix B

Official Letter

ที่ อว ๐๖๔๓.๑๔/บฑ. ๒๑๗

มหาวิทยาลัยราชภัฏบ้านสมเด็จเจ้าพระยา
๑๐๖๑ อิสรภาพ ๑๕ แขวงหิรัญรูจี
เขตธนบุรี กรุงเทพฯ ๑๐๖๐๐

๒๑ เมษายน ๒๕๖๖

เรื่อง ขอความอนุเคราะห์เก็บข้อมูลในการทำวิทยานิพนธ์

เรียน

เนื่องด้วย Mr.Chen Guoying นักศึกษาระดับบัณฑิตศึกษา หลักสูตรครุศาสตรดุษฎีบัณฑิต สาขาวิชาการบริหารการศึกษา มหาวิทยาลัยราชภัฏบ้านสมเด็จเจ้าพระยา ได้รับการอนุมัติให้ดำเนินการวิจัยวิทยานิพนธ์ เรื่อง "Strategies Development for Industry-Education Integration in Guangxi Application-Oriented Universities" โดยมีคณะกรรมการที่ปรึกษาวิทยานิพนธ์ ดังนี้

๑. ผู้ช่วยศาสตราจารย์ ดร.พัชรา เดชโฮม
๒. รองศาสตราจารย์ ดร.นิรันดร์ สุธีนิรันดร์
๓. ผู้ช่วยศาสตราจารย์ ดร.กุลสิรินทร์ อภิรัตน์วรเดช

ในการทำวิทยานิพนธ์ครั้งนี้ นักศึกษามีความจำเป็นต้องเก็บข้อมูล เพื่อประกอบการจัดทำวิทยานิพนธ์ ดังนั้น จึงใคร่ขอความอนุเคราะห์ให้นักศึกษาได้ทำการเก็บข้อมูลเพื่อนำไปประกอบการจัดทำวิทยานิพนธ์ให้สมบูรณ์ยิ่งขึ้น

จึงเรียนมาเพื่อโปรดพิจารณาหวังว่าคงได้รับความอนุเคราะห์จากท่านและขอขอบพระคุณมา ณ โอกาสนี้

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร.คณกร สว่างเจริญ)
คณบดีบัณฑิตวิทยาลัย

งานประสานบัณฑิตศึกษา
โทร ๐-๒๔๗๓-๗๐๐๐ ต่อ ๑๘๑๔

ที่ อว ๐๖๔๓.๑๔/บท. ๑๑๘

มหาวิทยาลัยราชภัฏบ้านสมเด็จเจ้าพระยา
๑๐๖๑ อิสรภาพ ๑๕ แขวงหิรัญรูจี
เขตธนบุรี กรุงเทพฯ ๑๐๖๐๐

๒๑ เมษายน ๒๕๖๖

เรื่อง ขอความอนุเคราะห์เก็บข้อมูลโดยการเข้าสัมภาษณ์

เรียน

สิ่งที่ส่งมาด้วย ๑.แบบสัมภาษณ์ จำนวน ๑ เล่ม

เนื่องด้วย Mr.Chen Guoying นักศึกษาระดับบัณฑิตศึกษา หลักสูตรครุศาสตรดุษฎีบัณฑิต สาขาวิชาการบริหารการศึกษา มหาวิทยาลัยราชภัฏบ้านสมเด็จเจ้าพระยา ได้รับการอนุมัติให้ดำเนินการวิจัยวิทยานิพนธ์ เรื่อง "Strategies Development for Industry-Education Integration in Guangxi Application-Oriented Universities"โดยมีคณะกรรมการที่ปรึกษาวิทยานิพนธ์ ดังนี้

๑.	ผู้ช่วยศาสตราจารย์ ดร.พัชรา เดชโฮม	ประธานที่ปรึกษาหลัก
๒.	รองศาสตราจารย์ ดร.นิรันดร์ สุธีนิรันดร์	อาจารย์ที่ปรึกษาร่วม
๓.	ผู้ช่วยศาสตราจารย์ ดร.กุลสิรินทร์ อภิรัตน์วรเดช	อาจารย์ที่ปรึกษาร่วม

ในการนี้คณะกรรมการบริหารหลักสูตรฯ ได้พิจารณาเห็นว่าท่านเป็นผู้เชี่ยวชาญที่มีความรู้ความสามารถที่จะให้ข้อมูล คำแนะนำอันเป็นประโยชน์ต่อการประเมินความเหมาะสมและความเป็นไปได้ของนักศึกษาได้เป็นอย่างดี จึงขออนุญาตให้นักศึกษาเข้าสัมภาษณ์ และกำหนดวันเวลาแก่นักศึกษาที่ท่านสะดวก

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์แก่นักศึกษาด้วยจะเป็นพระคุณยิ่ง

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร.คณกร สว่างเจริญ)
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ที่ อว ๐๖๔๓.๑๔/บท. ๑๑๙

มหาวิทยาลัยราชภัฏบ้านสมเด็จเจ้าพระยา
๑๐๖๑ อิสรภาพ ๑๕ แขวงหิรัญรูจี
เขตธนบุรี กรุงเทพฯ ๑๐๖๐๐

๒๑ เมษายน ๒๕๖๖

เรื่อง เชิญเป็นผู้เชี่ยวชาญตรวจสอบความตรงเชิงเนื้อหาเครื่องมือในการทำวิทยานิพนธ์

เรียน Professor Dr.Fen Wang, Guangxi University of Science and Technology

สิ่งที่ส่งมาด้วย ๑. เค้าโครงวิทยานิพนธ์ จำนวน ๑ เล่ม
๒. แบบสอบถาม จำนวน ๑ ชุด

เนื่องด้วย Mr.Chen Guoying นักศึกษาระดับบัณฑิตศึกษา หลักสูตรครุศาสตรดุษฎีบัณฑิต สาขาวิชาการบริหารการศึกษา มหาวิทยาลัยราชภัฏบ้านสมเด็จเจ้าพระยา ได้รับการอนุมัติให้ดำเนินการวิจัยวิทยานิพนธ์ เรื่อง “Strategies Development for Industry-Education Integration in Guangxi Application-Oriented Universities” โดยมีคณะกรรมการที่ปรึกษาวิทยานิพนธ์ ดังนี้

๑. ผู้ช่วยศาสตราจารย์ ดร.พัชรา เดชโฮม	ประธานที่ปรึกษาหลัก
๒. รองศาสตราจารย์ ดร.นิรันดร์ สุธีนิรันดร์	อาจารย์ที่ปรึกษาร่วม
๓. ผู้ช่วยศาสตราจารย์ ดร.กุลสิรินทร์ อภิรัตน์วรเดช	อาจารย์ที่ปรึกษาร่วม

ในการทำวิทยานิพนธ์ครั้งนี้ นักศึกษาจำเป็นต้องตรวจสอบความตรงเชิงเนื้อหา (Content Validity) ของเครื่องมือ เพื่อให้ได้เครื่องมือที่สมบูรณ์ที่สุด ทางบัณฑิตวิทยาลัยได้พิจารณาเห็นว่าท่านเป็นผู้ทรงคุณวุฒิ มีความรู้ความสามารถสอดคล้องกับหัวข้อการทำวิทยานิพนธ์ ดังกล่าวเป็นอย่างยิ่ง ซึ่งคำแนะนำของท่านจะเกิดประโยชน์ต่อการปรับปรุงแก้ไขในการสร้างเครื่องมือสำหรับการวิจัยของนักศึกษาให้มีคุณภาพและเหมาะสมเพื่อใช้ในการเก็บรวบรวมข้อมูลในการวิจัยต่อไป

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์แก่นักศึกษาด้วยจะเป็นพระคุณยิ่ง

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มหาวิทยาลัยราชภัฏบ้านสมเด็จเจ้าพระยา
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เขตธนบุรี กรุงเทพฯ ๑๐๖๐๐

๒๑ เมษายน ๒๕๖๖

เรื่อง เชิญเป็นผู้เชี่ยวชาญตรวจสอบความตรงเชิงเนื้อหาเครื่องมือในการทำวิทยานิพนธ์

เรียน Professor Dr.Lei Yuan, Guangxi Normal University

สิ่งที่ส่งมาด้วย ๑. เค้าโครงวิทยานิพนธ์ จำนวน ๑ เล่ม
๒. แบบสอบถาม จำนวน ๑ ชุด

เนื่องด้วย Mr.Chen Guoying นักศึกษาระดับบัณฑิตศึกษา หลักสูตรครุศาสตรดุษฎีบัณฑิต สาขาวิชาการบริหารการศึกษา มหาวิทยาลัยราชภัฏบ้านสมเด็จเจ้าพระยา ได้รับการอนุมัติให้ดำเนินการวิจัยวิทยานิพนธ์ เรื่อง "Strategies Development for Industry-Education Integration in Guangxi Application-Oriented Universities" โดยมีคณะกรรมการที่ปรึกษาวิทยานิพนธ์ ดังนี้

๑. ผู้ช่วยศาสตราจารย์ ดร.พัชรา เดชโฮม	ประธานที่ปรึกษาหลัก
๒. รองศาสตราจารย์ ดร.นิรันดร์ สุธีนิรันดร์	อาจารย์ที่ปรึกษาร่วม
๓. ผู้ช่วยศาสตราจารย์ ดร.กุลสิรินทร์ อภิรัตน์วรเดช	อาจารย์ที่ปรึกษาร่วม

ในการทำวิทยานิพนธ์ครั้งนี้ นักศึกษาจำเป็นต้องตรวจสอบความตรงเชิงเนื้อหา (Content Validity) ของเครื่องมือ เพื่อให้ได้เครื่องมือที่สมบูรณ์ที่สุด ทางบัณฑิตวิทยาลัยได้พิจารณาเห็นว่าท่านเป็นผู้ทรงคุณวุฒิ มีความรู้ความสามารถสอดคล้องกับหัวข้อการทำวิทยานิพนธ์ ดังกล่าวเป็นอย่างยิ่ง ซึ่งคำแนะนำของท่านจะเกิดประโยชน์ต่อการปรับปรุงแก้ไขในการสร้างเครื่องมือสำหรับการวิจัยของนักศึกษาให้มีคุณภาพและเหมาะสมเพื่อใช้ในการเก็บรวบรวมข้อมูลในการวิจัยต่อไป

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์แก่นักศึกษาด้วยจะเป็นพระคุณยิ่ง

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร.คณกร สว่างเจริญ)
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งานประสานบัณฑิตศึกษา
โทร ๐-๒๔๗๓-๗๐๐๐ ต่อ ๑๘๑๔

ที่ อว ๐๖๔๓.๑๔/บท. ๑๒๑

มหาวิทยาลัยราชภัฏบ้านสมเด็จเจ้าพระยา
๑๐๖๑ อิสรภาพ ๑๕ แขวงหิรัญรูจี
เขตธนบุรี กรุงเทพฯ ๑๐๖๐๐

๒๑ เมษายน ๒๕๖๖

เรื่อง เชิญเป็นผู้เชี่ยวชาญตรวจสอบความตรงเชิงเนื้อหาเครื่องมือในการทำวิทยานิพนธ์

เรียน Professor Dr.Wang Min, Liuzhou City Vocational College

สิ่งที่ส่งมาด้วย ๑. เค้าโครงวิทยานิพนธ์ จำนวน ๑ เล่ม
๒. แบบสอบถาม จำนวน ๑ ชุด

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๑. ผู้ช่วยศาสตราจารย์ ดร.พัชรา เดชโอม	ประธานที่ปรึกษาหลัก
๒. รองศาสตราจารย์ ดร.นิรันดร์ สุธีนิรันดร์	อาจารย์ที่ปรึกษาร่วม
๓. ผู้ช่วยศาสตราจารย์ ดร.กุลสิรินทร์ อภิรัตน์วรเดช	อาจารย์ที่ปรึกษาร่วม

ในการทำวิทยานิพนธ์ครั้งนี้ นักศึกษาจำเป็นต้องตรวจสอบความตรงเชิงเนื้อหา (Content Validity) ของเครื่องมือ เพื่อให้ได้เครื่องมือที่สมบูรณ์ที่สุด ทางบัณฑิตวิทยาลัยได้พิจารณาเห็นว่าท่านเป็นผู้ทรงคุณวุฒิ มีความรู้ความสามารถสอดคล้องกับหัวข้อการทำวิทยานิพนธ์ ดังกล่าวเป็นอย่างยิ่ง ซึ่งคำแนะนำของท่านจะเกิดประโยชน์ต่อการปรับปรุงแก้ไขในการสร้างเครื่องมือสำหรับการวิจัยของนักศึกษาให้มีคุณภาพและเหมาะสมเพื่อใช้ในการเก็บรวบรวมข้อมูลในการวิจัยต่อไป

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์แก่นักศึกษาด้วยจะเป็นพระคุณยิ่ง

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร.คณกร สว่างเจริญ)
คณบดีบัณฑิตวิทยาลัย

งานประสานบัณฑิตศึกษา
โทร ๐-๒๔๗๓-๗๐๐๐ ต่อ ๑๘๑๔

ที่ อว ๐๖๔๓.๑๔/บท. ๑๒๒

มหาวิทยาลัยราชภัฏบ้านสมเด็จเจ้าพระยา
๑๐๖๑ อิสรภาพ ๑๕ แขวงหิรัญรูจี
เขตธนบุรี กรุงเทพฯ ๑๐๖๐๐

๒๑ เมษายน ๒๕๖๖

เรื่อง เชิญเป็นผู้เชี่ยวชาญตรวจสอบความตรงเชิงเนื้อหาเครื่องมือในการทำวิทยานิพนธ์

เรียน Professor Dr.Ting Zhang, Xiangsihu College of Guangxi University for Nationalities

สิ่งที่ส่งมาด้วย ๑. เค้าโครงวิทยานิพนธ์ จำนวน ๑ เล่ม
๒. แบบสอบถาม จำนวน ๑ ชุด

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๑. ผู้ช่วยศาสตราจารย์ ดร.พัชรา เดชโฮม	ประธานที่ปรึกษาหลัก
๒. รองศาสตราจารย์ ดร.นิรันดร์ สุธีนิรันดร์	อาจารย์ที่ปรึกษาร่วม
๓. ผู้ช่วยศาสตราจารย์ ดร.กุลสิรินทร์ อภิรัตน์วรเดช	อาจารย์ที่ปรึกษาร่วม

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เรียน 'Professor Dr.Liu Kai, Liuzhou Institute of Technology

สิ่งที่ส่งมาด้วย ๑. เค้าโครงวิทยานิพนธ์ จำนวน ๑ เล่ม
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คณบดีบัณฑิตวิทยาลัย

งานประสานบัณฑิตศึกษา
โทร ๐-๒๔๗๓-๗๐๐๐ ต่อ ๑๘๑๔

Appendix C

Research Instrument

1.Survey Questionnaire

Survey Questionnaire on the Strategies of development for industry-education integration of Application-oriented Universities in Guangxi

Instructions:

In order to understand the current situation of the integration of industry and education in Guangxi's application-oriented universities and to propose strategies conducive to the development of the integration of industry and education in Guangxi's application-oriented universities, a questionnaire survey will be conducted on the managers of the application-oriented universities involved in the integration of industry and education.

Each question and answer in this questionnaire is not right or wrong, and the answers you provide will only be used for overall statistical analysis. They will never be processed or publicly released individually, and the information will be kept strictly confidential and not disclosed to anyone. You do not need to provide your personal name when filling out the questionnaire. Please feel free to answer the questions.

Part 1: Respondent Status (Personal Information)

1.School**:**

❒ Nanning University

❒ Liuzhou Institute of Technology

❒ Guilin University

❒ Guangxi Science & Technology Normal University

❒ Baise University

❒ Hechi University

❒ Hezhou University

❒ Wuzhou University

❒ Beibu Gulf University

❒ Yulin Normal University

2.Gender:

❒male;

❒female

3.Age:

❒25 years old or below;

❒26 to 35;

❒36 to 45;

❒46 to 55;

❒56 years old or up

4.Education:

❒Bachelor degree;

❒Master's degree;

❒Doctoral degree

5.Position:

❒Teaching assistant;

❒The lecturer or Assistant Professor;

❒Associate professor;

❒Professor

6.Experience:

❒within 5 years;

❒5 to 10 years;

❒11 to 15 years;

❒16 to 20 years;

❒More than 20 years

Part 2: Questionnaire

NO.	Dependent Variable Name	5	4	3	2	1
	Teacher resources management (The first variable)					
1	Managers have human resource management skills					
2	Universities have a sound teacher resources management mechanism					
3	University teachers have working experience in enterprises					
4	The management mode of joint training of teachers by universities and enterprises					
5	A mutual appointment system between university teachers and enterprise engineers is in place					
6	Sufficient teachers with enterprise experience					
7	Universities have a mechanism for the growth of teachers with enterprise practice and training					
8	Teachers are highly motivated to participate in practical training in enterprises					
	Financial management (The second variable)					
1	The financial management system of universities in the integration of education and industry					
2	Universities have clear planning in financial analysis and control					
3	University managers have scientific financial decision-making ability					
4	Management mode of joint venture between universities and enterprises					
5	Universities have sufficient financial investment in the integration of education and industry					

NO.	Dependent Variable Name	5	4	3	2	1
6	Effective management and use of funds are achieved					
7	Universities can add value to corporate brands					
8	Universities can increase the income of enterprise profit					
	Management mechanism (The third variable)					
1	Managers have the ability to manage the integration of education and industry in universities					
2	Universities have a perfect management mechanism for the integration of education and industry					
3	The managers of universities have management experience in the integration of education and industry					
4	Management mode of integration of education and industry between universities and enterprises					
5	Mutual appointment system between university managers and senior managers of enterprises					
6	People with rich experience in enterprise management serve as education managers for the integration of education and industry					
7	The growth mechanism of university managers with the integration of education and industry					
8	High enthusiasm of managers of the integration of education and industry in universities to participate in enterprise practice and posting					
	Talent cultivation (The fourth variable)					
1	A perfect education system for the integration of education and industry is available					

NO.	Dependent Variable Name	5	4	3	2	1
2	Universities have cultivation mode for students' internship					
3	Universities and enterprises have the training mode of alternating engineering					
4	Scientific talent cultivation mode of integration of education and industry					
5	Universities and enterprises jointly carry out professional skills certification					
6	Universities and enterprises jointly build teaching resources library					
7	Universities and enterprises jointly build talent cultivation mechanism					
8	Universities and enterprises jointly cultivate talents that meet the needs of regional industries					

2.Interview outline

Interview outline of Strategies of development for industry-education integration of Application-oriented Universities in Guangxi

Instructions:

The interviewees in this study were 10 middle managers of Guangxi application-oriented universities who were obliged to ensure that they had the following conditions: (a) they had been middle managers of industry-education integration work in Guangxi application-oriented universities for at least 10 years and above; (b) they were familiar with the operation mode of enterprises and universities and had a deep understanding of industry-education integration work; (c) they must be willing to participate in the recorded semi-structured interviews; (d) they must be willing to have their interview transcripts audited and validated.

Part 1: Respondent Status (Personal Information)

1.Name (Interviewee):

2.Position:

3.School:

4.Date of Interview:

5.Length of interview:

Part 2 Interview outline

content	question
Teacher resources management	1. Regarding the current situation of teacher resources management in the integration of industry-education in Guangxi application-oriented universities, what management strategies are suggested for teacher resources management?
Financial management	2. Regarding the current situation of financial management of the integration of education and industry in Guangxi application-oriented universities,

content	question
	what kind of management strategies are suggested in financial management?
Management mechanism	3. Regarding the current situation of the management mechanism of the integration of education and industry in Guangxi application-oriented universities, what management strategies are suggested in the management mechanism?
Talent cultivation	4. Regarding the current situation of talent cultivation in the integration of education and industry in Guangxi application-oriented universities, what kind of management strategies are suggested for talent cultivation?

3. Assessment checklist

Assessment checklist of Strategies of Development for Industry-Education Integration of Application-Oriented Universities in Guangxi

Thank you very much for your busy schedule and participation in the evaluation of this study. Please assess the adaptability and feasibility of the management strategy of Guangxi application-oriented universities based on the integration of industry and education, with the numbers 5, 4, 3, 2 and 1 corresponding to extra high, high, average, low and extra low.

Assessment checklist	Adaptability					Feasibility				
	5	4	3	2	1	5	4	3	2	1
Strategies										
1. Teacher resources management										
Develop an effective management model for the training of teachers in the integration of industry and education										
Formulate policies for the development of teachers for the integration of industry and education										
Plan teacher resources and personnel allocation in a scientific and reasonable manner										
Improve teacher training system and guide teachers to develop career planning										
Establish a scientific teacher evaluation system and link it to performance appraisal and title										

Assessment checklist	Adaptability					Feasibility				
	5	4	3	2	1	5	4	3	2	1
evaluation										
2. Financial management										
Improve the financial management system and regulate the use of funds for the integration of education and industry projects										
Introduce diversified funding sources to improve the financial sustainability of the integration of industry-education projects										
Set up special funds for integration of industry-education to guarantee financial investment										
Strengthen financial training for managers and cultivate financial decision-making ability										
Strengthen financial supervision and risk management to ensure the financial security of the integration of education and industry projects										
3. Management mechanism										
Establishing a sound management mechanism for the integration of industry and education										
Establish a clear organizational structure and management system										
Appoint people with enterprise management experience as managers of the integration of industry and education										
Strengthen the standardized management of										

Assessment checklist	Adaptability					Feasibility				
	5	4	3	2	1	5	4	3	2	1
cooperative projects and clarify the distribution of rights and interests between the two parties involved in cooperative projects										
Establish a scientific and reasonable performance evaluation and incentive mechanism to stimulate the enthusiasm of participants										
4. Talent development										
Establishing a scientific talent development model for the integration of industry and education										
Establish a curriculum system of integration of industry and education										
Provide necessary conditions for students' internship in enterprises to improve their practical ability										
Build a teaching resource library with enterprises										
Strengthen students' career planning and employment services										

Appendix D
The Results of the Quality Analysis of Research Instruments

1.Reliability Analysis

Simplified Format of Cronbach's Reliability Analysis

Number of Items	Sample Size	Cronbach's Alpha Coefficient
32	155	0.916

From the table above, it can be seen that the reliability coefficient value is 0.916, which is greater than 0.9, indicating that the quality of the research data reliability is high. Regarding the "α coefficient with deleted items," the reliability coefficient does not significantly increase when any item is deleted. Therefore, it indicates that the items should not be deleted. Regarding the "CITC value," the CITC values for all analyzed items are above 0.4, indicating that there is a good correlation between the analyzed items, which also indicates a good reliability level. In summary, the reliability coefficient value of the research data is higher than 0.9, which comprehensively indicates high data reliability quality and can be used for further analysis.

2.Adaptability Analysis

KMO and Bartlett's tests		
KMO value		0.902
Bartlett's sphericity test	Approximate chi-square	12139.751
	df	569
	p-value	0.000

The KMO and Bartlett tests were used to validate the adaptability. From the table above, it can be seen that the KMO value is 0.902, which is greater than 0.8, indicating that the research data is highly suitable for extracting information (which indirectly reflects good adaptability).

Appendix E

Certificate of English


มหาวิทยาลัยราชภัฏบรมราชชนก

Bansomdejchaopraya Rajabhat University

This is to certify that

MR. CHEN GUOYING

Has participated in BSRU-TEST of English Proficiency (BSRU – TEP) Training Course and Achieved BSRU-TEST of English Proficiency (BSRU – TEP) level

C 1

Given on 16th February 2020

(Assistant Professor Dr. Phadet Kakham)

Vice President

Appendix F

The Document for Acceptance Research

Researcher Profile

European Chemical Bulletin
E-ISSN : 2063 - 5346
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NANO STUDIES

Acceptance Letter

Dear Author(s): **Guoying Chen , Patchara Dechhome**

Paper ID	ECB_37
Paper Title	Strategies Development for Industry-education Integration Application-Oriented Universities in Guangxi

This is to enlighten you that above manuscript reviewed and appraised by the review committee members of **BioLEAGUES** and it is accepted for the purpose of publication in the **"European Chemical Bulletin"**.
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1. **Proof of Registration/Payment - Scanned | Online Received Email**
2. **BioLEAGUES Copyright form** https://www.iferp.in/copyright/

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- postgraduate course, Guangxi Arts University, in 2015
- Bachelor of Arts, Guangxi Arts University, in 2005

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