

# Research on the Coordinated Development of Higher Vocational Education and Industry in Guangdong Province Under the Background of Industry Education Integration

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## ABSTRACT

This study focuses on the coordinated development of vocational education and industry in Guangdong Province under the background of industry education integration, aiming to analyze the current situation, reveal problems, and propose optimization strategies. With policy support, Guangdong Province has deepened the reform of talent cultivation through the integration of industry and education, promoted customized joint training between enterprises and schools, cultivated industry education integrated enterprises, and jointly built secondary colleges and industrial colleges, significantly improving the efficiency of education and industry integration. However, the mismatch between professional and industrial demands remains prominent. Although there has been progress in school-enterprise cooperation, there are still problems such as shallow levels, low enthusiasm for enterprise participation, and uneven development levels. The construction of professional clusters is not synchronized with the development of industrial clusters, lacks a sharing concept, and is not closely connected. The exploration of mixed ownership faces institutional bottlenecks. To optimize collaborative development, it is recommended to strengthen policy support and resource integration, deepen industry education integration and school-enterprise cooperation, improve the teacher team and teaching quality, in order to promote the high-quality development of vocational education in Guangdong Province and better serve the local economic transformation and upgrading.

**Keywords:** *Integration of industry and education, Vocational education, Professional clusters, Industry, Collaborative development.*

## 1. INTRODUCTION

In the current era of global economic integration and rapid technological development, the pace of industrial transformation and upgrading is accelerating, and the demand for high-quality technical and skilled talents is becoming increasingly urgent. The integration of industry and education, as a model of deep cooperation between education and industry, has been given the dual mission of promoting industrial upgrading and educational reform, and has received high attention and strong advocacy at the national level. Guangdong Province, as the forefront of China's economic development, has a strong industrial foundation and a complete range of categories. At

the same time, it is also in a leading position in the field of vocational education and has numerous high-quality vocational colleges. This provides unique conditions and vast space for studying the coordinated development of vocational education and industry in Guangdong Province under the background of industry education integration.

However, there are still many problems and challenges in the current process of coordinated development between vocational education and industry in Guangdong Province, such as insufficient depth and breadth of school-enterprise cooperation, disconnection between professional settings and industry demand, and uneven regional coordinated development. These problems constrain the ability of vocational education to

serve the development of the industry and also affect the sustainable development of the industry. Therefore, in-depth exploration of the mechanism of coordinated development between vocational education and industry in Guangdong Province under the background of industry education integration is of great theoretical significance and practical value for optimizing the allocation of vocational education resources, improving the quality of talent cultivation, promoting industrial upgrading, and achieving high-quality regional economic development. This study aims to systematically analyze the current situation, problems, and causes of the coordinated development of higher vocational education and industry in Guangdong Province, draw on advanced experiences at home and abroad, construct a scientific and reasonable mechanism for coordinated development, and provide useful reference and guidance for the practice of industry education integration in Guangdong Province and even the whole country.

## **2. THEORETICAL BASIS FOR THE INTEGRATION OF INDUSTRY AND EDUCATION AND THE COORDINATED DEVELOPMENT OF HIGHER VOCATIONAL EDUCATION**

The integration of industry and education is a model of deep cooperation between education and industry. Its core lies in closely integrating the education process with the actual needs of the industry, forming a virtuous cycle of mutual promotion and complementary advantages between education and industry. This model not only helps to cultivate high-quality skilled personnel, but also promotes the in-depth cooperation and common development of education and industry. The following will elaborate on several main theoretical foundations:

### ***2.1 Synergetics Theory***

Synergetics originated in the 1970s and was proposed by German physicist Hermann Haken. It mainly studies the synergistic effects between various elements in a system and their impact on the overall function of the system. In the integration of industry and education in higher vocational education, the application of collaborative theory is mainly reflected in the following aspects: firstly, collaborative theory emphasizes the importance of

resource sharing. In the integration of industry and education, schools and enterprises achieve resource sharing through cooperation. Schools provide teaching resources and research achievements, while enterprises provide practical resources and technical support, complementing each other's strengths to enhance the quality of education and industrial competitiveness. Secondly, establish an effective information exchange mechanism to ensure information exchange between schools and enterprises. By regularly holding school-enterprise cooperation exchange meetings and setting up dedicated information liaison officers, schools and enterprises can timely understand each other's needs and dynamics, adjust teaching content and training programs, and improve the pertinence and effectiveness of talent cultivation. Thirdly, design and implement a school enterprise joint training program to enable students to receive both theoretical knowledge and practical skills training during their school years. Enterprises can participate in curriculum design, teaching implementation, and student evaluation, providing practical training bases and guidance teachers. Through this educational model that combines theory with practice, students can enhance their comprehensive quality and employment competitiveness, and better adapt to market demand. Fourthly, the synergy theory emphasizes the importance of policy support and incentive mechanisms. The government should introduce relevant policies to encourage school-enterprise cooperation, provide financial support and policy incentives, and promote the in-depth development of industry education integration.

### ***2.2 Stakeholder Theory***

The stakeholder theory emphasizes the participation and interest demands of all stakeholders in education and industry cooperation. In the integration of industry and education in vocational education, stakeholders include the government, vocational colleges, enterprises, students, industry organizations, etc. By coordinating the interests of all parties, a harmonious situation of co construction, co management, and sharing can be formed, achieving win-win cooperation among multiple entities. Firstly, the government plays the role of a policy maker and coordinator in the integration of industry and education. By introducing relevant policies and regulations, it guides and regulates school-enterprise cooperation, provides financial support and policy incentives, and promotes the healthy

development of industry education integration. Secondly, vocational colleges are the main body of talent cultivation. By cooperating with enterprises, optimizing professional settings and curriculum systems, improving teaching quality, and cultivating high-quality technical and skilled talents that meet industry needs. Once again, enterprises are the main body of industrial development. By participating in the talent training process of vocational colleges, providing practical bases and guidance teachers, we ensure that students have practical work abilities and can also meet the talent needs of enterprises themselves. Finally, students are the direct beneficiaries of the integration of industry and education. Through the training model of school-enterprise cooperation, they can enhance their practical abilities and employment competitiveness, and better adapt to market demand.

### ***2.3 Educational Ecological Theory***

The theory of educational ecology regards education as an ecosystem, where industries provide resources and demands, and the two are interdependent and mutually reinforcing. In the integration of industry and education in higher vocational education, the theory of educational ecology emphasizes the following aspects: firstly, education and industry as a whole system, interact with each other and jointly promote the development of the system. Through school-enterprise cooperation, optimize the allocation of educational and industrial resources, and enhance the overall efficiency of the system. Secondly, the education and industrial system is dynamically developing and needs to be adjusted and optimized in a timely manner according to changes in the external environment. For example, with the update of industrial technology and changes in market demand, vocational colleges should adjust their professional settings and course content in a timely manner to ensure a close connection between talent cultivation and industrial demand. Thirdly, the theory of educational ecology emphasizes the diversity of the system and encourages vocational colleges to cooperate with different types of industries based on their own characteristics and advantages, forming diversified models of industry education integration.

### ***2.4 Social Partnership Theory***

The theory of social partnership advocates the establishment of long-term and stable cooperative relationships between schools and enterprises,

jointly undertaking the social responsibility of talent cultivation and industrial development. In the integration of industry and education in higher vocational education, the theory of social partnership emphasizes the following aspects: firstly, both schools and enterprises establish a long-term and stable cooperative relationship through signing a cooperation agreement, jointly participating in the entire process of talent cultivation, including professional settings, curriculum development, internship and training, employment guidance, etc. Secondly, both schools and enterprises should share resources, including teaching facilities, faculty, research achievements, etc., to achieve optimized allocation and efficient utilization of resources. Thirdly, establish a common governance mechanism, including decision-making mechanism, coordination mechanism, evaluation mechanism, etc., to ensure the smooth progress and continuous optimization of cooperative projects. Through in-depth dialogue and negotiation, we can jointly solve the problems and challenges encountered in cooperation.

## **3. THE CURRENT SITUATION OF COORDINATED DEVELOPMENT BETWEEN VOCATIONAL EDUCATION AND INDUSTRY IN GUANGDONG PROVINCE UNDER THE BACKGROUND OF INDUSTRY EDUCATION INTEGRATION**

### ***3.1 Policy Support and Planning Layout***

The Guangdong Provincial Government attaches great importance to the integration of industry and education, and has issued a series of policy documents to promote the precise matching of education supply and industrial demand. At the provincial level, we will coordinate and arrange pilot reforms and resource allocation for the integration of industry and education, and support reform and innovation from planning, policies, projects, and other aspects. Pilot city governments, industries, enterprises, schools and other entities actively carry out pilot projects, accelerate institutional and mechanism innovation, establish benchmarks for industry education integration reform, and form a development pattern of industry education integration with cities as nodes, industries as pivot points, enterprises as key points, and schools as the basis. Through pilot exploration, gradually deepening the integration of industry and

education, exploring new methods, models, and paths for the development of industry education integration in the province, constructing institutional frameworks and mechanisms to promote industry education integration, improving the combination incentive policy system, promoting precise matching between education supply and industry demand, and organic integration of industry development and education reform.

### ***3.2 Reform of Talent Cultivation Through the Integration of Industry and Education***

Guangdong Province has carried out multiple reforms in the integration of industry and education talent cultivation, integrating the cultivation of craftsmanship spirit into basic education and strengthening labor education in primary and secondary schools. Intensify the efforts of enterprises and schools to provide customized joint training for students and enterprise personnel, and promote leading enterprises to participate in vocational education, applied undergraduate education, and professional degree graduate education. Cultivate industry education integration enterprises and industries, promote the joint construction of secondary colleges and industrial colleges between enterprises and higher education institutions and vocational colleges, and carry out deep cooperation with schools in professional settings, curriculum development, practical training and internships, enrollment and employment, etc. Support higher education institutions and vocational colleges within the province to establish professional talent training bases in industrial parks based on industry characteristics and enterprise needs. Encourage industries and enterprises to participate in the development of school professional construction plans, talent training programs, and the establishment of a capacity evaluation standard system. Fully implement modern apprenticeship system and enterprise new apprenticeship system in technical majors, and provide vocational training subsidies to eligible enterprises according to regulations. Pilot cities should gradually increase the participation rate of enterprises above designated size in school-enterprise cooperation. Enterprises should, in principle, arrange professional internships for students in corresponding positions not less than 2% of the total number of employees.

### ***3.3 School-Enterprise Cooperation and Practice Base Construction***

Guangdong vocational colleges have cooperated with enterprises to build a large number of practical bases, enhancing students' practical abilities and employment competitiveness. As of June 2023, Guangdong has established 146 vocational industry colleges, and Huawei has collaborated with vocational colleges to establish 15 ICT industry colleges. With the opening of China's "New Engineering" construction, in recent years, undergraduate universities in Guangdong have taken the initiative to face the main battlefield of economic development, relying on the intensive development of the manufacturing industry, and have sparked a wave of building industrial colleges. For example, Guangdong University of Technology has established the Guangdong Hong Kong Robotics Joint College, with industry elites as teachers, enterprise laboratories as classrooms, school-enterprise cooperation, and project driven teaching throughout the process; Dongguan University of Technology and Huawei Technologies Co., Ltd. jointly establish Huawei Information and Network Technology College; Shenzhen University and Tencent Cloud Computing (Beijing) Co., Ltd. jointly establish the Tencent Cloud Artificial Intelligence College at Shenzhen University. By the end of 2023, there will be 218 industrial colleges established in 45 undergraduate universities in Guangdong, with a training scale of over 46000 undergraduate students and more than 6000 faculty members from schools and enterprises.

### ***3.4 Depth and Balanced Development of Industry-Education Integration***

There is a significant difference in the level of development of school-enterprise cooperation in Guangdong Province, and there are obvious differences in the depth and breadth of school-enterprise cooperation among various majors within schools. Backbone majors have more school-enterprise cooperation projects and close connections with enterprises, while small majors often have fewer cooperation projects and even no long-term stable school-enterprise cooperation projects. There are also significant differences in the depth and breadth of school-enterprise cooperation between different schools. Traditionally, vocational schools with industry backgrounds have better depth and breadth of school-enterprise cooperation, while schools or

campuses closer to industrial parks have more frequent school-enterprise cooperation. In addition, mixed ownership exploration has entered deeper waters, slowing down the pace of progress. Enterprises and schools urgently need targeted guidance from government departments such as education, human resources and social security, development and reform, and state-owned assets on how to establish and operate physical industrial colleges. Especially in the exploration process of mixed ownership in industrial colleges, there is a lack of policy basis for defining asset investment, property ownership and equity distribution between schools and enterprises, accounting for corporate teacher income, and setting ratios.

#### **4. PROBLEMS IN THE COLLABORATIVE DEVELOPMENT OF PROFESSIONAL INDUSTRIES IN GUANGDONG VOCATIONAL COLLEGES UNDER THE BACKGROUND OF INDUSTRY EDUCATION INTEGRATION**

##### ***4.1 Insufficient Depth and Breadth of School-Enterprise Cooperation***

Firstly, the level of school-enterprise cooperation is shallow. At present, the integration of industry and education carried out in vocational colleges is still mainly focused on providing on-the-job internship positions and internship bases, and the resources provided are mostly personnel, technology or general information in the form of primary cooperation. There are relatively few successful cases of deep level cooperation, such as providing advanced equipment to schools, participating in joint scientific and technological research and development to solve technical problems, technical consulting, and enterprises establishing production-oriented training workshops on campus.

Secondly, the enthusiasm of enterprises to participate is not high. Although the enthusiasm of enterprises to participate in talent training activities in vocational colleges has been increasing year by year, the overall situation is still "hot in schools and cold in enterprises". Enterprises have not been deeply integrated into the process of running schools, and there is a lack of clear incentives, financial support and other supporting policies, which makes it difficult for vocational colleges to

make breakthroughs in promoting the integration of industry and education.

Thirdly, the level of development of school-enterprise cooperation is uneven. There are significant differences in the depth and breadth of school-enterprise cooperation among various majors within the school. Backbone majors have more school-enterprise cooperation projects and close connections with enterprises, while small majors often have fewer cooperation projects and even no long-term stable school-enterprise cooperation projects. There are also significant differences in the depth and breadth of school-enterprise cooperation between different schools. Traditionally, vocational schools with industry backgrounds have better depth and breadth of school-enterprise cooperation, while schools or campuses closer to industrial parks have more frequent school-enterprise cooperation.

##### ***4.2 The Construction of Professional Clusters and the Development of Industrial Clusters Are Not Synchronized***

Firstly, the concept of sharing in the construction of professional groups is not strong. Many professional groups lack a scientifically advanced concept of group building and a sharing philosophy based on cooperative purposes. Lack of awareness of unity and cooperation among various professional groups, and relatively loose relationships; The professional group teacher team is constrained by the administrative department's block based setting model, making it difficult to fully leverage the collaborative advantages of the teacher team; The training equipment and training base are not fully utilized, and the utilization rate is extremely low.

Secondly, there is a lack of close integration between professional groups and industrial clusters. The construction of professional clusters in vocational colleges is not synchronized with the development of industrial clusters, making it difficult to form effective support. For example, the clustering trend of professional clusters in vocational colleges in Guangdong Province is not obvious. Most of the provincial high-level professional clusters in schools are related to the national high-level professional clusters they are building, which is reflected in the horizontal dimension rather than the vertical dimension. It is difficult to form effective support for the national

high-level professional clusters by provincial high-level professional clusters.

Thirdly, exploring mixed ownership into deeper waters. There are various forms of integration between industry and education in vocational education, and modern industrial colleges with secondary colleges as the main form have a good development momentum. But with the deepening of the integration of industry and education, the bottleneck of the industrial college system urgently needs to be overcome. Enterprises and schools urgently need targeted guidance from government departments such as education, human resources and social security, development and reform, and state-owned assets on how to establish and operate physical industrial colleges. Especially in the exploration process of mixed ownership in industrial colleges, there is a lack of policy basis for defining asset investment, property ownership and equity distribution between schools and enterprises, accounting for corporate teacher income, and setting ratios.

## **5. EXPERIENCE AND REFERENCE OF FOREIGN INDUSTRY EDUCATION INTEGRATION AND COORDINATED DEVELOPMENT OF HIGHER VOCATIONAL EDUCATION**

### ***5.1 Germany's "Dual System" Model***

The "dual system" vocational education model in Germany is a model in the world of vocational education, with its core being the close integration of vocational college learning with enterprise production practice. More than half of the students' time is spent on practical work in enterprises, while the other half is spent receiving theoretical education in vocational schools. This model not only improves students' practical abilities, but also enhances the efficiency of vocational education and market integration. The German government ensures a close connection between education and industry demand through legislation, provides financial support, and guarantees education quality by establishing standards and certification requirements. The training provided by enterprises to students is also subject to government supervision to ensure that the training quality meets national standards. This model significantly enhances the attractiveness and effectiveness of vocational education, providing high-quality skilled labor for enterprises.

### ***5.2 The "Modern Apprenticeship" Model in the UK***

The modern apprenticeship system in the UK combines students' learning with practical work through a vocational education model of work learning. Students receive systematic training in enterprises and theoretical education in vocational schools. This model not only enhances students' practical abilities, but also strengthens the market adaptability of vocational education. The UK government encourages businesses to participate in apprenticeship training through policy support and funding, ensuring that educational content is highly aligned with business needs. This model provides students with practical work experience and also cultivates high-quality talents that meet the needs of enterprises.

### ***5.3 The American Community College System***

The community college system in the United States is known for its flexible and diverse cooperation methods and comprehensive vocational education policies. Community colleges offer diverse learning paths to meet the needs of different social groups. Most students work and study at the same time, and the funding structure of community colleges supports this flexibility. The US government promotes cooperation between businesses and educational institutions through policy tools such as incentives, regulations, and public campaigns to ensure that educational content reflects the latest industry development needs in a timely manner. This model not only improves the inclusiveness and accessibility of vocational education, but also provides diversified high-quality talents for enterprises.

### ***5.4 The Japanese "Combination of Industry, Official and University" Model***

The "Combination of Industry, Official and University" model in Japan is a representative of its integration of industry and education. Its core lies in closely integrating universities, enterprises, and government departments to jointly promote technological innovation and industrial development. The government encourages cooperation between universities and enterprises through policies and funding support to promote the transformation and application of scientific research results. Universities collaborate with enterprises to

transform research results into practical applications, improving research level and application value; By collaborating with universities, enterprises can obtain the latest technological achievements and technical talents, promoting technological upgrading and innovative development. This model has become an important support for the development of Japan's high-tech industry and provides useful reference for other countries.

## **6. SUGGESTIONS FOR OPTIMIZING THE COORDINATED DEVELOPMENT OF VOCATIONAL EDUCATION AND INDUSTRY IN GUANGDONG PROVINCE**

### ***6.1 Strengthening Policy Support and Resource Integration***

Firstly, Guangdong Province should further improve the policy support system for the integration of industry and education, and introduce specific implementation rules and operational guidelines to ensure the operability and implementation of policies. For example, specific measures such as tax incentives and financial subsidies for school-enterprise cooperation should be clearly defined to encourage enterprises to actively participate in vocational education. It is necessary to establish a Greater Bay Area Vocational Education Development Committee, which will be led by administrative departments such as education, development and reform, finance, and human resources, and will consist of vocational colleges, industry associations, and enterprises as the main members, to ensure the coordinated development of vocational education is promoted. Thirdly, with the central city of the Greater Bay Area as the core, it is necessary to break through the geographical proximity of vocational education resource flow, promote mutual borrowing of regional resources, and promote differentiated development., accelerate the exploration and demonstration of the "Guangdong Hong Kong Macao Greater Bay Area Characteristic Vocational Education Park" in cities such as Guangzhou, Shenzhen, Foshan, and Dongguan, and build it into a world-class international demonstration zone for vocational education and a national highland for innovative development of vocational education.

### ***6.2 Deepening the Integration of Industry and Education and School-Enterprise Cooperation***

Firstly, vocational colleges in Guangdong Province should be guided by industrial demand, rely on advantageous majors (groups), leverage the talent aggregation advantages of vocational colleges, and organically combine talent cultivation, teacher professional development, student internship and training, innovation and entrepreneurship, and enterprise service technology innovation functions to build a deep cooperation platform between industry, academia and research. As of August 2023, Guangdong Province has established 82 provincial-level demonstration industrial colleges. Secondly, It is essential that the pilot of the modern apprenticeship system be promoted by relevant authorities. In 2023, 57 vocational colleges, 202 enterprises, and 53 carriers have launched modern apprenticeship pilot programs in 310 professional points. By jointly developing professional talent training plans, professional talent standards, curriculum systems, and curriculum standards through school-enterprise cooperation, a diversified talent training evaluation and feedback mechanism is established to form a talent training plan that accurately matches the needs of the industry. Thirdly, It is important for educational institutions and enterprises to jointly establish on-campus and off-campus training bases. For example, Guangdong Vocational and Technical College has established the "Guangdong Vocational and Technical College Guangdong Chunxiao Information Technology Co., Ltd. On campus Training Base" on campus, and has set up corresponding off campus practical teaching bases with external signs. Both parties can use the name of the jointly built base in the information released to the public and carry out cooperation in management, training, internship, training, scientific research, etc.

### ***6.3 Enhancing the Teaching Staff and Teaching Quality***

Firstly, it is necessary for the Industrial College to establish a mechanism for two-way flow and part-time work between school and enterprise talents, and to jointly establish a "dual teacher dual ability" teacher training base. School teachers and enterprise mentors carry out teacher exchanges, seminars, training, and practical exercises in enterprises. Both parties will jointly teach and guide, and jointly build a high-level, structured

teaching team that integrates industry and education. Secondly, schools and enterprises should jointly reconstruct the professional curriculum system, create online and offline, virtual simulation, enterprise practice and other professional teaching resources, develop practical and integrated work manual style textbooks based on real industry tasks, and jointly develop high-quality online open courses. Thirdly, it is essential for educational institutions to enrich digital teaching resources, promote the "classroom revolution," and improve teaching quality and students' learning experience. Through the role of "promoting learning and teaching through competition", organize and carry out provincial vocational college teacher teaching ability competitions and student professional skill competitions to enhance teachers' teaching abilities and students' professional skill levels.

## **7. CONCLUSION AND PROSPECT**

### **7.1 Research Conclusion**

This study deeply explores the current situation, problems, and optimization strategies of the coordinated development of higher vocational education and industry in Guangdong Province under the background of industry education integration. Research has found that Guangdong Province has achieved significant results in policy support, reform of talent cultivation for industry education integration, school-enterprise cooperation, and construction of practice bases, forming a development pattern of industry education integration with cities as nodes, industries as pivot points, enterprises as the focus, and schools as the basis. However, there are still some challenges, such as policy bottlenecks in exploring mixed ownership and insufficient depth and balanced development of school-enterprise cooperation. By strengthening policy support and resource integration, deepening industry education integration and school-enterprise cooperation, and improving the teacher team and teaching quality, measures can be taken to further optimize the coordinated development of vocational education and industry in Guangdong Province, and promote the high-quality development of vocational education.

### **7.2 Prospect**

Firstly, it is essential for relevant authorities to further deepen the mechanism of industry-education integration. In the future, more flexible

and diverse cooperation models should be explored, such as the construction of mixed-ownership industrial colleges. The policy bottleneck of school-enterprise cooperation should be broken, and the deep integration of education and industry should be promoted.

Secondly, it is crucial that regional collaboration and cooperation be strengthened by relevant parties. Strengthen the collaborative cooperation between the eastern, western, and northern regions of Guangdong and the Pearl River Delta region, promote the balanced development of educational resources, enhance the level of vocational education in the eastern, western, and northern regions of Guangdong, and promote coordinated regional economic development.

Once again, it is important for relevant organizations to expand international cooperation and exchanges. Drawing on international advanced experience, strengthening cooperation and exchanges with developed countries and regions in the field of vocational education, introducing high-quality educational resources and advanced teaching concepts, and enhancing the internationalization level of vocational education in Guangdong Province.

Finally, it is necessary for the government to continuously optimize the policy support system. The government should continue to optimize the policy support system, increase investment in vocational education, improve incentive mechanisms, encourage enterprises and social forces to participate in vocational education, and form a good situation for the whole society to jointly promote the development of vocational education.

## **ACKNOWLEDGMENTS**

Fund Project: "Research on the Adaptability of Vocational Education Majors and Industries in Guangdong Province under the Background of Industry Education Integration" (Project Number: 2023WTSCX247), a characteristic innovation project for ordinary universities in Guangdong Province in 2023; Shenzhen Polytechnic University Characteristic Innovation Project "Research on the Coordinated Development of Higher Vocational Education and Industry in the Guangdong Hong Kong Macao Greater Bay Area under the Trend of Industrial Evolution" (Project No. 6022310012S).

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