

School-Enterprise Integration Model for Higher Vocational Colleges in Guangdong Province

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ABSTRACT

The purpose of the study is to explore the level and composition of school-enterprise integration for higher vocational colleges in Guangdong Province. 63 colleges Chinese vocational colleges are selected to be the population. A mixed-methods approach was adopted for this research. After conducting an extensive literature review, a quantitative research methodology was employed using a 5-level Likert-scale questionnaire. The survey was distributed to 500 respondents, selected through stratified random sampling. Exploratory factor analysis (EFA) was carried out to analyze the data, with a group of 9 experts providing an importance assessment of the identified factors. The EFA revealed that the factors influencing the development of the talent training mode can be grouped into five key factors ranked by priority are: Teacher Professional Development and Industry Expertise (Mean=3.81, S. D. = 0.98), Government Policy and Institutional Support (Mean=3.73, S. D.= 0.92), Student Employability and Industry Satisfaction (Mean=3.56, S.D. = 0.89), Curriculum and Teaching Innovation (Mean=3.43,S.D. =0.85), Industry Education Synergy (Mean=3.11, S.D. = 0.80). Each factor was assessed for its mean score and standard deviation, indicating varying degrees of importance and variation in responses. The study concludes that effective school-enterprise integration in vocational colleges depends on a combination of factors with teacher professional development and industry-expertise, and government policy and institutional support as the most critical. The findings emphasize the need for a holistic approach that integrates both academic and industry perspectives to enhance the employability of graduates. The results of this research provide valuable insights for vocational colleges,

enterprises, and policymakers in optimizing school-enterprise integration model. By focusing on the identified key factors, institutions can improve career guidance, enhance internship opportunities, and better align educational programs with the evolving demands of the employment market, particularly in the context of technological advancements.

Keywords: School-Enterprise Integration Model, Institutions-Enterprise Cooperation, Higher Vocational Colleges

1. Introduction

In recent years, the transformation of China's higher education system has become a focal point, particularly in terms of aligning academic training with the rapidly evolving demands of the labor market. The increasing emphasis on industry-academia collaboration has led to a paradigm shift in school-enterprise integration model. As a key hub of economic development, Guangdong, with its unique geographical and industrial advantages, provides an ideal case for exploring the potential of higher education institutions' cooperation with enterprises.

School-enterprise integration models in higher education institutions have long been a subject of debate among policymakers, educators, and industry leaders. Traditional models, which have predominantly focused on theoretical and academic education, are often criticized for their disconnection from industry needs and their limited adaptability to the dynamic socio-economic landscape. This misalignment between educational output and industry demand has created an urgent need for innovative School-enterprise integration that effectively integrate the strengths of both educational institutions and enterprises.

The importance of industry-education cooperation in improving the quality and relevance of school-enterprise integration is increasingly recognized. Research has shown that such collaborative models not only bridge the skills gap but also cultivate a dynamic, adaptable workforce capable of addressing the challenges of the modern economy. Given Guangdong's strategic position as a hub for manufacturing and technological innovation, the city presents a unique opportunity to develop a localized and sustainable school-enterprise integration that supports the growth of both higher education institutions and key industries in the region.

This study aims to examine the development of school-enterprise integration model that integrates the resources and expertise of higher vocational colleges and enterprises in Guangdong. By reviewing existing research and current trends, the paper seeks to provide

critical insights into the practical and theoretical implications of such models. The significance of this research lies in its potential to inform policy decisions, enhance educational practices, and contribute to the cultivation of high-quality, industry-relevant talent, not only within Guangdong but also across broader contexts in China.

2. Literature review

The alignment between higher education and labor market needs has become a critical area of concern in contemporary educational research, especially in light of the evolving economic and technological landscape in China. As global and local labor markets undergo rapid transformation, it has become imperative for educational institutions to adapt their teaching models to equip graduates with the skills required by industries. The integration of industry and academia has emerged as a fundamental strategy to address the widening gap between academic training and labor market demands.

2.1 Industry-Academia Collaboration and School-Enterprise Integration

The concept of school-enterprise integration has garnered significant attention in vocational and higher education, emphasizing the importance of aligning educational practices with industry needs to cultivate practical skills and professional competence. (Zheng et. al., 2011) highlight that while theoretical analyses of this talent training mode are prevalent, practical explorations reveal critical issues related to enterprise operation forms, teaching reforms, and management practices, underscoring the complexity of implementing effective integration models.

Further, (Zheng et. al., 2013) exemplify the development of curriculum systems tailored to specific majors, such as hotel management, emphasizing a systematic approach based on the working process. Their research advocates for constructing curriculum systems that follow a logical sequence—from investigation and task analysis to learning situation design—ensuring that training aligns closely with real-world job requirements (Zheng,2013). In the context of interdisciplinary fields, Mao et. al. (2014) explores the cultivation of IT service outsourcing talents through school-enterprise cooperation, emphasizing the importance of integrating cross-disciplinary knowledge and practical training to meet industry demands. Similarly, Liu et. al. (2015) proposes a four-step model of school-enterprise integration in architectural decorative art design, focusing on breaking traditional cooperation barriers and fostering professional talents aligned with enterprise needs.

Curriculum reform remains a central theme, with (Yu, 2018) advocating for modular, team-based, and diversified evaluation approaches that incorporate informatization and the "STC+ Four-in-one" concept. This approach aims to enhance curriculum relevance and lifelong applicability, reflecting a shift towards more flexible and adaptive educational models. Complementing this, Meng (2019) emphasizes the importance of integrating production and teaching with school-enterprise cooperation to innovate talent cultivation, particularly in computer application technology, thereby addressing practical teaching challenges and improving educational outcomes.

Wang (2019) extends this discussion to logistics management, proposing an integrated training mode based on production-education collaboration and innovative practices. His research underscores the significance of collaborative education in developing applied talents that meet industry standards. Huang (2020) further emphasizes the role of integrating campus and corporate cultures, professional humanities training, and teacher development to foster well-rounded socialists with comprehensive moral, intellectual, and aesthetic qualities, thereby enriching the humanistic dimension of school-enterprise integration.

In secondary vocational education, Xie et. al. (2021) examines reforms in the cuisine specialty, demonstrating practical applications of school-enterprise integration models to enhance talent cultivation tailored to regional industry needs. Finally, Huang (2023) addresses the broader systemic issues in university-industry cooperation, proposing mechanisms to deepen industry-education integration through systemic, platform, and model innovations. His work aims to establish sustainable, long-term cooperation frameworks that support the continuous development of vocational education.

Guangdong, as a key industrial city, has made substantial strides in integrating higher education with local enterprises. Several studies emphasize the importance of developing specialized talent for Guangdong's growing high-tech sector. The local government has implemented policies such as funding for university-enterprise collaborative projects, creating innovation-driven educational environments, and offering incentives for enterprises that collaborate with educational institutions. This has led to the development of a more dynamic and industry-relevant talent pipeline, supporting the broader economic goals of the city.

2.2 Factors Influencing School-Enterprise Integration

The relationship between higher education and employability is complex, with multiple factors influencing graduates' success in securing relevant employment. Various studies have identified key factors that significantly affect employability outcomes. The five factors

identified in this study—Teacher Professional Development and Industry Expertise, Government-Policy-and-Institutional-Support, Student-Employability-and-Industry Satisfaction, Curriculum-and-Teaching-Innovation, Industry-Education-Synergy are critical elements in understanding the factors influencing employability in the Chinese context.

Teacher Professional Development and Industry Expertise, recent meta-studies emphasize that effective teacher professional development (TPD) includes hands-on, collaborative, and context-specific experiences. For example, Amemasor et al. (2025) analyzed 23 studies (2020–2024) and found that elements like ongoing mentorship, institutional support, and digital training significantly enhance teachers' integration of technology into instruction. Similarly, advanced T-USE models demonstrate that embedding teachers in industry environments strengthens their professional capital and alignment with enterprise needs emerald.com

Government-driven policies and institutional mechanisms function as critical enablers for advancing school-enterprise integration in vocational education. Xue and Li (2022) conducted a retrospective analysis of multiple national-level reforms in China, emphasizing how these policy initiatives have institutionalized collaborative frameworks to formalize vocational school–enterprise cooperation. Furthermore, innovative applications of cognitive graph methodologies within the tripartite (Government-Enterprise-School) talent cultivation model have been demonstrated to enhance inter-organizational coordination and improve graduates' employment outcomes (e.g., post-graduation employment rate and job matching quality). These findings align with the small positive mean value (Mean=0.01) observed for the policy factor in the present study, thereby underscoring that while government policies provide essential support for school-enterprise integration, they do not operate as the sole decisive factor.

Across empirical research, deeper enterprise engagement in vocational education initiatives has been consistently associated with improved student outcomes, spanning both learning effectiveness and post-graduation adaptability. Shao and Sagubo (2024) employed a mixed-methods research design—integrating quantitative surveys (N = 487) and qualitative semi-structured interviews (n=32) to illustrate that strategic school-enterprise collaboration fosters enriched learning experiences (e.g., industry-relevant practical training), enhances graduate employability (measured by employer recruitment preference), and elevates satisfaction levels among industry stakeholders. Specifically, evaluations of school-enterprise integration models implemented across various regions in China have documented that

participating students exhibit stronger innovation capabilities and greater project readiness (e.g., proficiency in solving real-world industrial problems) compared to those in traditional vocational education programs.

Curriculum innovation requires active collaboration, but systemic inertia can inhibit change. Dual-education literature (2023) shows that enterprise co-designed curricula improve relevance; yet implementation remains inconsistent.

Deeper synergy hinges on unified goals, compatible cultures, and legal frameworks. But fundamental misalignments often persist: Zheng (2019) observed cultural gaps between profit-driven enterprises and education-focused schools. Vocational program evaluations note incomplete legal systems and coordination challenges within school-enterprise ecosystems.

2.3 Industry-Education Integration in Guangdong

Guangdong represents an interesting case for examining the integration of higher education and industry, as it balances traditional manufacturing sectors with emerging high-tech industries. The city's efforts to align higher education with the needs of its key industries are essential for the development of a highly skilled workforce that can support its economic goals. Recent studies on Guangdong's higher education system have shown that the city has made substantial investments in educational reforms aimed at improving the employability of graduates and fostering industry-relevant skills. Collaborative initiatives between universities and local enterprises in Guangdong have become more common, with a focus on innovation, technology, and high-skilled talent cultivation.

The role of government policy in facilitating industry-education collaboration in Guangdong is critical. Government policies play a significant role in promoting the integration of industry and academia. These policies support the establishment of partnerships between universities and enterprises, encourage research and development collaborations, and provide financial incentives for businesses to engage in educational programs. The alignment of educational outcomes with the needs of local industries is seen as a key strategy for ensuring sustainable economic growth and increasing the city's global competitiveness.

3. Research methodology

Quantitative research was used to conduct the research, followed by exploratory factor analysis (EFA).

3.1 Population and Samples

A probability sampling technique is used, as this study is generalized to higher vocational colleges in Guangdong Province; therefore, researchers suggest that in case of high generalization, probability sampling in quantitative data is appropriate. The study's population was 500 teachers and administrators in 63 colleges in stratified and simple random sampling techniques were used to select the 500 respondents. Table 1 shows sample collection

Table 1 Personal status of respondents

Personal status	n=500	Percentage
1.Gender		
Male	275	55.00%
Female	225	45.00%
2.Age		
under 25 years old	54	10.80%
25 - 29 years old	143	28.60%
30 - 39 years old	236	47.20%
40-49 years old	41	8.20%
Above 49 years old	26	5.20%
3.Educational Background		
Bachelor	164	32.80%
Master	220	44.00%
Doctor	88	17.60%
Postdoctoral appointment	28	5.60%
4.Work Experience		
under 5 years	49	9.80%
5 – 10 years	90	18.00%
11 – 15 years	135	27.00%
16 – 20 years	202	40.40%
Above 20 years	24	4.80%

3.2 Research Tools

A 110-item questionnaire was used to evaluate each participant's opinions concerning quality management. A five-level educator opinion scale was used, which was reviewed by a panel of 9 education experts whose qualifications were no less than a doctorate. Each of the

130 items was then evaluated using the index of item-objective congruence (IOC) value. The questionnaire's aim, item clarity, comprehensiveness, completeness, meaningfulness, and significance for each item were evaluated. The IOC values for the study were 0.8 to 1.00, with items below 0.60 removed according to the experts' suggestions.

The questionnaire's reliability was then evaluated using 30 individuals who did not participate in the subsequent survey. The assessment of the 30 individual's questionnaire try-out reliability used Cronbach's alpha ($\alpha = .976$).

Before the final survey, the researcher sent a letter from the 63 vocational colleges in Guangdong Province asking permission to collect survey data. Once each school granted permission, teachers were randomly selected and contacted with Line social media and given a questionnaire QR code to participate.

3.3 Data Analysis

From the development of talent Training core Factors analysis, the suitability test and the correlation coefficient matrix between the variables were examined using descriptive statistics (percentage, mean and standard deviation), the Kaiser-Meter-Olkin (KMO), and Bartlett's test of sphericity. Additionally, the analysis extracted the factors using principal component analysis (PCA) to determine which variables were most important. It consisted of the Factors, Eigenvalues, percentage of variance, and cumulative percentage of variance.

The correlation between variables being more common as a constituent was more clearly defined by the varimax rotation method to find the quality management core Factors by using the selection criteria for question variables with a factor loading $\geq .50$ and the number of variables in each component. There must be at least three variables to be considered as one component.

4. Results

4.1 Correlation Matrix Suitability Results

Table 2 shows that the KMO (Kaiser-Meyer-Olkin) indicates that the observed variables' correlation matrix was not a unique matrix, which therefore shows that there are enough correlations between variables for variables analyzing indicators. Confirmation of this was determined by the KMO Measure of Sampling Adequacy = 0.976, which is considered excellent. Also, Bartlett's test of sphericity was used to test the desirability of proceeding to factor extraction. It is a hypothesis test that the correlation matrix is an identity matrix. Determination was made that the Chi-Square = 28509.924 had a statistical significance Sig=.000, $p \leq .05$,

indicating that the correlation matrix obtained is not a unity matrix. This confirmed that the variables are correlated and are suitable for factor analysis.

Table 2 KMO and Bartlett Test

KMO and Bartlett's Test		
KMO		0.976
	Chi-Square	28509.924
Bartlett's Test of Sphericity	df	2775
	Sig	0.000

4.2 Factor Extraction and Rotation

The researcher extracted the factors using the principal component analysis (PCA) to determine which variables were most important. It consists of the Factors, eigenvalues, percentage of variance, and cumulative percentage of variance (Table 3). Liu (2021) have suggested that factors with eigenvalues ≥ 1.00 be retained. Table 3 shows the Eigenvalues, which are the sum of the squares of the coefficients of each factor ≥ 1.00 , and the 5 factors have a percentage of cumulative variance of 67.961%. The fifth and sixth factors are not grouped since fewer than three factors exist in an element. Additionally, in Table 2 and Table 3, the descriptive definitions for each Factor are as follows:

Factor 1 =Teacher Professional Development and Industry Expertise (TPDIE)

Factor 2 = Government Policy and Institutional Support (GPIS)

Factor 3 = Student Employability and Industry Satisfaction (SEIS)

Factor 4 = Curriculum-and-Teaching-Innovation (CTI)

Factor 5 = Industry-Education- Synergy (IES)

Table 3 Total Variance Explained

Total Variance Explained									
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	27.953	37.270	37.270	27.953	37.270	37.270	10.665	14.221	14.221
2	5.791	7.722	44.992	5.791	7.722	44.992	10.545	14.060	28.281
3	5.049	6.732	51.724	5.049	6.732	51.724	10.508	14.010	42.291
4	4.128	5.503	57.228	4.128	5.503	57.228	7.773	10.364	52.655

Total Variance Explained									
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
5	3.323	4.431	61.659	3.323	4.431	61.659	6.753	9.004	61.659
6	.998	1.331	62.990						
7	.894	1.192	64.181						
8	.803	1.071	65.252						
Extraction Method: Principal Factor Analysis and Varimax									

Table 4 shows the study's analysis from the Varimax rotation, usually the second step in factor analysis and a PCA (Abdi, 2003). Factor rotation and a Varimax rotation; transform the initial factors into new ones that are simpler to interpret. The results of the analysis of orthogonal rotation Factors by the varimax method and the variables in each component must have a weight of $\geq .50$ or more. The investigator chose the highest weight for each factor in the study's development of talent Training for higher education Institution-enterprise cooperation core value analysis. A total of 130 items, since 40 of the factors that were scraped out are subtracted. Table 4 thus shows the remaining 8 factors with 90 items.

Table 4 Varimax rotation

Item	Factor loading coefficient					
	Factor 1 (TPDIE)	Factor 2 (GPIS)	Factor 3 (SEIS)	Factor 4 (CTI)	Factor 5 (IES)	Common Factor Variance
89					.748	.636
56					.730	.677
42					.727	.654
103					.717	.628
5					.700	.682
90					.690	.660
67					.685	.637
29					.680	.645
77					.676	.619
58					.675	.618

Item	Factor loading coefficient					
	Factor 1 (TPDIE)	Factor 2 (GPIS)	Factor 3 (SEIS)	Factor 4 (CTI)	Factor 5 (IES)	Common Factor Variance
81					.658	.685
36				.779		.712
31				.754		.684
19				.733		.614
74				.732		.618
73				.732		.687
17				.718		.602
48				.714		.645
28				.714		.660
35				.712		.669
78				.699		.665
11				.694		.557
93				.669		.615
72		.774				.598
76		.746				.678
9		.742				.625
85		.739				.560
14		.739				.638
104		.734				.631
22		.732				.540
63		.731				.557
51		.727				.601
46		.725				.634
16		.722				.640
83		.717				.603
87		.714				.621
40		.698				.642
18		.685				.524
25		.674				.584

Item	Factor loading coefficient					
	Factor 1 (TPDIE)	Factor 2 (GPIS)	Factor 3 (SEIS)	Factor 4 (CTI)	Factor 5 (IES)	Common Factor Variance
57		.666				.610
80	.749					.652
101	.737					.601
64	.736					.610
24	.733					.638
15	.725					.610
38	.720					.612
27	.715					.556
55	.710					.540
7	.701					.596
60	.693					.539
84	.692					.652
102	.686					.568
53	.676					.570
4	.674					.632
32	.667					.567
79	.657					.557
69	.655					.550
21	.646					.579
33			.746			.685
22			.745			.641
65			.740			.570
86			.738			.617
98			.735			.637
52			.730			.646
104			.725			.544
106			.724			.485
109			.721			.639
76			.715			.611

Item	Factor loading coefficient					
	Factor 1 (TPDIE)	Factor 2 (GPIS)	Factor 3 (SEIS)	Factor 4 (CTI)	Factor 5 (IES)	Common Factor Variance
108			.714			.694
1			.712			.624
2			.702			.554
3			.697			.594
50			.691			.682
74			.661			.653

Extraction Method: Principal Factor Analysis

Rotation Method: Varimax with Kaiser Normalization

In the scree plot shown in Figure 1, the slope between the 8th and 9th factors becomes less steep, indicating that the amount of information explained by the subsequent 6th factor decreases significantly. This suggests that the first 5 factors can cover most of the information, thus selecting 8 factors is appropriate.

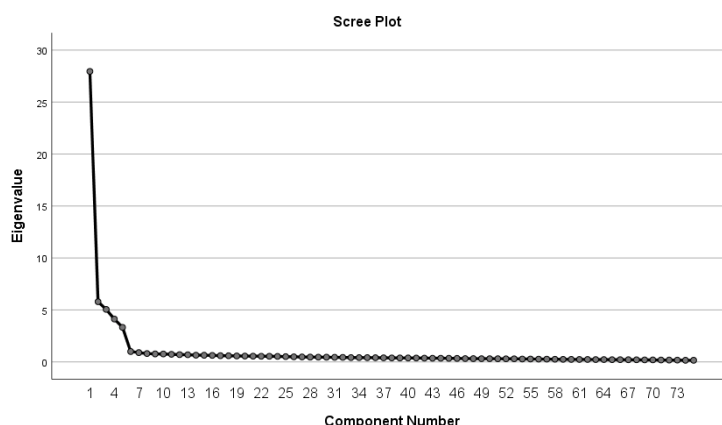


Figure 1 Scree plot

Table 5 shows the core Factors results arranged in order of Table 3's Eigenvalues.

Table 5 Factors weight

Factors	Percentage of Variance Cumulative %	
	Lowest	Highest
1	0.587	0.666
2	0.534	0.606
3	0.544	0.633

4	0.568	0.624
5	0.578	0.649

Table 6 shows the means, standard deviations, and opinion rankings of factors. Results revealed that overall, Factor1 (Teacher Professional Development and Industry Expertise) was judged by the respondents to be the most important core element in the model (Mean = 3.81, S.D = 0.98). This was followed by the other three Factors that were nearly equal in their ranking scores.

Table 6 Means, Standard Deviations, and Opinion Ranking

Factors	Mean	S.D	RANK
1	3.81	0.98	Highest
2	3.73	0.92	High
3	3.56	0.89	High
4	3.43	0.85	High
5	3.11	0.80	High

The study underscores that a multifaceted approach is required to strengthen the integration of education and industry, with active engagement from all stakeholders—schools, enterprises, government, and educators—working collaboratively to create an education system that is responsive to the evolving demands of the labor market. By designing future plans through Ethnographic Future Research (EFR) techniques, A school-Enterprise Integration Model in higher vocational colleges in Guangdong Province from Interviews with 9 experts can be constructed as shown in Figure 2.

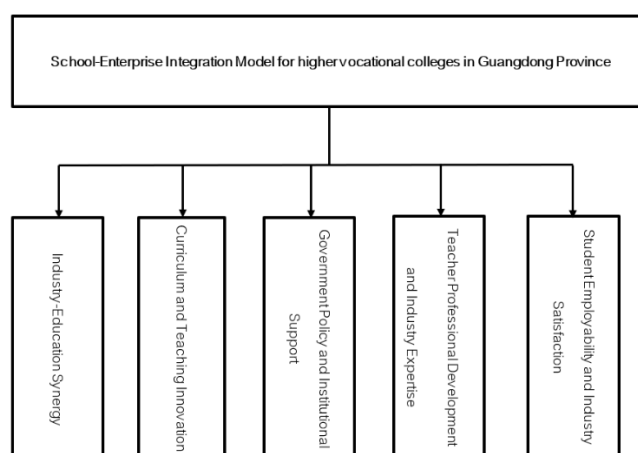


Figure 2 School-Enterprise Integration Model

5. Conclusion and Discussion

Factor 1. Teacher Professional Development and Industry-Expertise

The integration of industry expertise into teacher professional development is crucial in promoting practical, up-to-date knowledge transfer within vocational education. Teachers with industry experience are better positioned to deliver context-relevant content, enhance student engagement, and align learning outcomes with labor market needs. Furthermore, collaborative training programs with industry partners significantly improve teachers' technical capabilities and adaptability in digital teaching environments (Amemasor et al., 2025; Gondwe, 2021).

This study's findings indicate that although this factor has a relatively neutral mean (Mean=3.81), its higher standard deviation (S.D=0.98) suggests varying levels of development across institutions. Effective strategies such as joint training platforms and teacher internships in enterprises could help standardize and enhance this component.

Factor 2. Government Policy and Institutional Support

Government-led frameworks and policies play a foundational role in facilitating successful school-enterprise integration. Clear legislation, funding mechanisms, and strategic guidance are essential to encourage institutional participation and ensure sustained cooperation. As found by Xue and Li (2022), China's vocational education reform is heavily driven by top-down policies that incentivize collaboration between schools and enterprises.

The slight positive mean (Mean=3.73) and (S.D =0.92) suggest relatively balanced yet diverse implementations. Variability may stem from regional disparities in policy enforcement or institutional responsiveness.

Factor 3. Student Employability and Industry Satisfaction

Student outcomes are at the core of school-enterprise cooperation. The ability of institutions to enhance students' employability directly reflects the effectiveness of such partnerships. A student's technical proficiency, soft skills, and workplace readiness influence not only employment rates but also long-term industry satisfaction (Shao & Sagubo, 2024).

The high mean (Mean =3.56) and moderate variation (S.D = 0.89) affirm this factor's importance and consistency across cases. Strengthening real-world training, such as internships and coop programs, can further improve this synergy.

Factor 4. Curriculum and Teaching Innovation

Innovative curricula that integrate interdisciplinary content and project-based learning are critical to bridging academic learning with industrial practice. Modern teaching models that

incorporate digital tools, simulation technologies, and enterprise involvement enrich students' learning experiences (Zhang et al., 2023).

Despite a slightly negative mean (Mean=3.43), the relatively low S.D (S. D=0.85) suggests stability across institutions. The finding implies a general acceptance of curriculum reform, though room remains for enhancing innovation intensity and depth.

Factor 5. Industry-Education Synergy

The strategic alignment of educational goals with industrial demands—termed industry-education synergy—is the cornerstone of sustainable cooperation models. Close partnerships enable curriculum co-development, joint assessment, and feedback mechanisms, creating a virtuous cycle of talent production and utilization (Zheng, 2019).

The most negative mean (Mean=3.11) and smallest S.D (S.D=0.80) imply this factor is still underdeveloped across many institutions, likely due to communication gaps, misaligned incentives, or lack of long-term planning. Future efforts should focus on building structured, institutionalized mechanisms for school-enterprise dialogue and co-governance.

The integration of school and enterprise is a dynamic, multi-dimensional process that requires cohesive policy frameworks, institutional commitment, industry engagement, and continuous innovation. Future efforts should emphasize the interconnectivity of these five factors to build a sustainable, mutually beneficial model of vocational education. These findings contribute to the growing body of literature on industry-education integration in China and provide practical implications for educational institutions, policymakers, and enterprises seeking to improve talent development models in Guangdong.

6. Future recommendations

Although the study's goals and objectives have been met, there are a few inescapable constraints that must be addressed in this part for all future researchers to address. Due to the tight timeline and scarce resources, research can only be broadly applied to higher vocational colleges in China. Therefore, in order to broaden the scope of the study and generalize it on a global scale, future research should include more people from throughout the globe. The higher vocational colleges' employees will have better knowledge, skills, and abilities as a result of the adoption of the quality management model in Chinese. All graduates will benefit from updating their expertise in this way, enabling them to deliver the best services for higher vocational colleges.

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