Journal of Information Systems Engineering and Management
2025, 10(36s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Advancing Employability through Work-Based Learning: A Case Study of Guangdong University of Technology's Application-Oriented Approach

Wijit Thongnun[1], Kesinee Chiwpreecha[2*], Zhang Shuxian[3],Pongsin Viseshsiri[4], Kirati Wongwisutthirat[5]
[1]Independent Researcher
[2,3,4] Eastern Asia University, Thailand
[5]Shinawatra University, Thailand.
* Corresponding Author Email: kesinee@eau.ac.th

ARTICLE INFO

Received: 20 Dec 2024
Revised: 20 Feb 2025
Accepted: 28 Feb 2025

ABSTRACT

Integrating production and education through hands-on learning has become vital for improving student employability and bridging the gap between academia and industry. This study explores how such integration can be effectively implemented in undergraduate programs at Guangdong University of Technology (GDUT), China. Using a mixed-methods approach, the research collected data from 196 faculty members and interviewed nine experts from academia and industry. The findings highlight that while work-based learning—such as internships, cooperative education, and practical training—is well-established, partnerships between the university and industry remain the weakest area. The study identifies key challenges, including inconsistent internship assessments and limited collaboration in curriculum development. To address these gaps, the research proposes a set of practical guidelines that emphasize AI-driven curriculum updates, standardized evaluation frameworks, and structured cooperation models between industry and educational institutions. These recommendations aim to make education more application-oriented and responsive to real-world needs. The study contributes meaningful insights for policymakers, educators, and industry leaders looking to enhance skill development and better prepare students for the workforce. By aligning academic programs with evolving market demands, GDUT's approach is a potential model for other universities pursuing industry-driven educational reform.

Keywords: Industry-Education Integration, Work-Based Learning, Practical Teaching, Curriculum Alignment, Skill Development

Introduction

In China's rapidly advancing industrial and technological sectors, higher education institutions face increasing pressure to produce graduates who are academically proficient and practically skilled. Guangdong University of Technology (GDUT), known for its focus on application-oriented education (Liao & Tang, 2021), exemplifies this challenge. Despite various efforts to connect academic theory with industrial practice, GDUT continues to experience a significant mismatch between its curriculum and the evolving demands of the labor market.

The problem is not a surplus of graduates but a skills gap: students often leave university with strong theoretical foundations but insufficient practical experience and industry-specific competencies (Zeng, 2021; Fan, 2023). Traditional teaching methods and limited alignment with real-world industry needs contribute to this disconnect, resulting in underprepared graduates and reduced employability. While initiatives like internships, cooperative education, and on-site industrial training

Journal of Information Systems Engineering and Management
2025, 10(36s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

exist, they have not yet achieved a meaningful, systematic integration of education and industry (Zhang, 2019).

This research addresses these persistent gaps by investigating the current state of industry-education integration at GDUT and proposing practical, evidence-based guidelines to enhance this alignment. Specifically, it focuses on four key areas: work-based learning, curriculum alignment, industry-institution partnerships, and targeted skill development. The goal is to support GDUT in transforming its undergraduate programs into a more dynamic, responsive system that better prepares students for the workforce and supports regional economic growth.

Research Questions

1. What are the current states of integrating production and education by practical teaching and application-oriented learning in the industrial sector for the undergraduate program of Guangdong University of Technology, China?
2. What are the guidelines for developing the integration of production and education by practical teaching and application-oriented learning in the industrial sectors for the undergraduate program of Guangdong University of Technology, China?

Research Objectives

1. To study the current state of integrating production and education by practical teaching and application-oriented learning in the industrial sector for the undergraduate program of Guangdong University of Technology, China.
2. To develop guidelines for integrating production and education by practical teaching and application-oriented learning in the industrial sectors for the undergraduate program of Guangdong University of Technology, China.

Significance of the Study

The research contributes to addressing systemic gaps in vocational education in several important ways. First, it enhances employability by aligning educational programs with current market demands, thereby increasing students' job readiness. Second, it fosters industry readiness by strengthening partnerships between educational institutions and industry, which helps reduce training time for new hires and supports regional economic growth. Third, it encourages innovation through project-based learning, motivating students to participate in research and development activities that tackle real-world industrial challenges.

Conceptual Framework

The conceptual framework of this study draws from a comprehensive literature review and is based on four pillars. Work-Based Learning (WBL) refers to educational strategies that integrate academic instruction with real-world industrial experience, enabling students to apply theoretical knowledge in practical settings. This approach encompasses internships, apprenticeships, cooperative education programs, and on-site industrial training, all of which offer students opportunities to develop technical and professional skills under the guidance of industry supervisors (Amest & Claro, 2021). By participating in authentic workplace environments, students gain hands-on experience, enhance their problem-solving abilities, and become acquainted with industry-specific practices and cultures, improving their readiness for future careers. **Curriculum Alignment** involves updating

Journal of Information Systems Engineering and Management
2025, 10(36s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

educational content and learning outcomes to reflect the latest industry trends and technological advancements, ensuring that students acquire skills aligned with current and future market needs. This alignment requires active collaboration between educators and industry experts to co-develop curricula that address evolving labor demands and emerging technologies (Wang, Lu, & Zhang, 2021). By tailoring academic programs to industry expectations, curriculum alignment helps bridge the gap between theoretical knowledge and practical application, ultimately enhancing graduate employability (Wang & Zhang, 2021). **Industry-Institution Partnerships** refer to formal collaborations between educational institutions and industry stakeholders designed to foster mutual benefits. These partnerships facilitate knowledge transfer, provide access to cutting-edge industrial practices, and enhance students' employability (CAI, 2021). Industries can contribute directly to educational programs through initiatives such as guest lectures, mentorship programs, research funding, and joint ventures (CAI, 2021). By bridging the gap between academia and industry, these partnerships expose students to real-world technologies and professional practices, better preparing them for the demands of the workforce. **Skill Development** focuses on cultivating technical, cognitive, and interpersonal skills that equip students for long-term career success. This includes hands-on technical training, soft skills development—such as communication, teamwork, and problem-solving—and certification programs that ensure graduates are workforce-ready (Fan, 2023). By addressing specific skill gaps identified by employers, this approach fosters innovation, adaptability, and alignment with the evolving demands of the industrial environment (Fan, 2023).

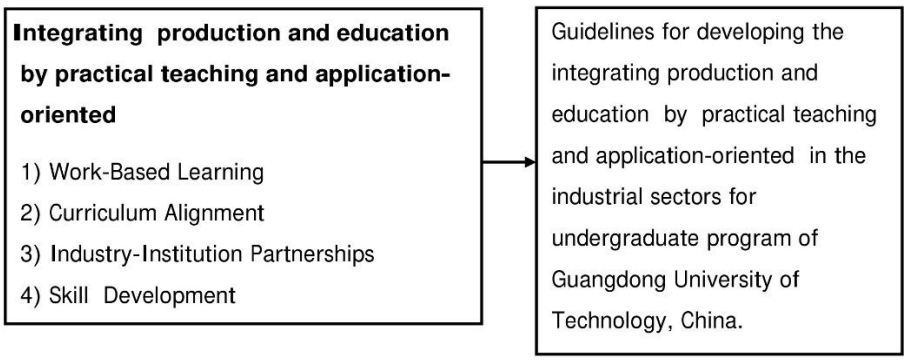

Figure 1: Research Conceptual Framework

The dependent variables are the key components or outcomes measured about the integration of production and education: Work-Based Learning, Curriculum Alignment, Industry-Institution Partnerships, and Skill Development. These dimensions are being influenced or enhanced by integrating production and education strategies. Integration of Production and Education by Practical Teaching and Application-Oriented Learning is the main independent variable because the study investigates how implementing and enhancing this educational approach impacts various aspects of the undergraduate program and student outcomes.

Literature Review

The current study builds upon the foundation laid by several influential works by expanding their findings within the context of Guangdong University of Technology (GDUT).

Damrongsiri et al. (2022) and Etzkowitz (2004) highlighted the growing need for stronger collaboration between academia and industry, urging the removal of traditional barriers to ensure

Journal of Information Systems Engineering and Management
2025, 10(36s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

educational programs align with real-world economic and technological demands. Building on this framework, the current study at GDUT proposes a structured model for industry-institution partnerships that operationalizes Etzkowitz's vision. By promoting internships, cooperative education, and project-based learning, the research offers practical guidelines to equip graduates with job-ready skills while enabling industry stakeholders to actively shape curriculum content, directly addressing Etzkowitz's call for academic-industrial integration.

Yang (2014) emphasized the need for deep integration between education and industry, particularly in countries undergoing rapid industrial transformation like China. He highlighted the importance of aligning vocational education with local economic development. Building on these insights, the current study applies Yang's concept to Guangdong Province, where GDUT plays a key role in supplying skilled labor to the region's manufacturing and technology sectors. By focusing on work-based learning and curriculum alignment, this research explores how GDUT can better meet evolving industry needs while supporting regional growth and aligning with national education reform efforts.

Jing (2019) identified key challenges in vocational education during the digital transformation era, particularly the lack of strong collaboration among government, industry, and educational institutions. She noted that rigid organizational boundaries often hinder long-term partnerships essential for effective integration of production and education. In response to these concerns, the present study proposes a collaborative framework for GDUT that promotes active engagement with the government and industry through digital platforms, internships, and joint research projects. It also extends Jing's work by recommending the use of technologies like blockchain and big data analytics to monitor and strengthen industry-education collaboration.

In conclusion, this study builds on the work of Etzkowitz (2004), Yang (2014), and Jing (2019) by applying their theoretical frameworks to the specific context of GDUT. While previous research highlighted the importance of integrating education with industry, the current study advances these ideas by offering practical guidelines for curriculum design, industry collaboration, and skill development. By embedding these insights into GDUT's institutional practices, the research aims to establish a more effective and sustainable vocational education model that responds to the evolving needs of both students and local industries.

Research Methodology, Population, Sampling, Data Collection, and Data Analysis

This study adopted a mixed-methods approach to examine the integration of production and education through practical and application-oriented teaching at Guangdong University of Technology (GDUT). The quantitative component targeted a population of 405 faculty members across 81 undergraduate programs. Using Krejcie and Morgan's (1970) table, a sample of 196 faculty members was selected through simple random sampling to assess key areas such as work-based learning, curriculum alignment, industry-institution partnerships, and skill development.

The qualitative phase involved semi-structured interviews with nine experts, including four GDUT deans, four industry representatives, and one academic scholar. Experts were selected based on their experience in industry-education collaboration and involvement in curriculum or workforce development.

Data collection tools included a structured questionnaire and an interview guide, both grounded in the study's conceptual framework. The questionnaire's content validity was verified by

Journal of Information Systems Engineering and Management
2025, 10(36s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

experts, with Item-Objective Congruence (IOC) scores ranging from 0.67 to 1.00 (Tirakanan, 2007). A pilot test with 30 participants yielded a Cronbach's Alpha of 0.87, indicating high reliability.

Quantitative data were analyzed using descriptive statistics—frequency, percentage, mean, and standard deviation—via SPSS. Qualitative data were examined through content analysis to identify themes and practical recommendations. This integrated approach allowed for a comprehensive understanding of how GDUT can enhance its alignment with industry needs and national vocational education reform initiatives.

Research Results

Table 1 Mean, standard deviation of the integrating production and Education status, obtained from the overall analysis and each aspect in Work-Based Learning

Work-Based Learning	$\bar{x}$	SD	level
8.Bridges the gap between classroom knowledge and industry practices	3.71	0.58	High
9.Offers industries a pool of potential future employees.	4.53	0.89	Highest
total	**4.28**	**0.74**	High

Table 2 Mean, standard deviation of the integrating production and Education status, obtained from the overall analysis and each aspect in Curriculum Alignment

Curriculum Alignment	$\bar{x}$	SD	level
1.Educational content and learning outcomes match the current and future needs of industry sectors	4.56	0.69	Highest
2.Involving industry experts to co-develop course content.	4.61	0.73	Highest
3.Competency mapping is an aligning learning objectives with job roles and industry requirements.	4.53	0.70	Highest
4. Interdisciplinary approach for integrating technical, managerial..	4.24	0.68	High
5.Creative skills for holistic development.	3.68	0.77	High
6.Supports lifelong learning and adaptability in a changing market.	3.31	0.64	Moderate
Total	**4.15**	**0.71**	**High**

Journal of Information Systems Engineering and Management
2025, 10(36s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Table 3 Mean, standard deviation of the integrating production and Education status, obtained from the overall analysis and each aspect in Industry-Institution Partnerships

Industry-Institution Partnerships	$\bar{x}$	SD	level
1. Collaborative relationships between Guangdong University of Technology, China	4.76	0.69	Highest
2.Collaborative with industries to enhance learning, research	3.94	0.53	High
3.Innovation, industry-funded facilities on campus for practical learning and development	3.72	0.50	High
4.Panels of industry experts advising on academic programs and policies	3.83	0.56	High
5.Co-delivered courses and workshops involving both faculty and industry professionals	3.41	0.52	Moderate
6.Facilitates the transfer of knowledge and technology between academia and industry	3.12	0.63	Moderate
7.Strengthens the employability of students by exposing them to cutting-edge practices.	3.34	0.55	Moderate
Total	**3.73**	**0.56**	**High**

Table 4 Mean, standard deviation of the integrating production and Education status, obtained from the overall analysis and each aspect of Skill Development

Skill Development	$\bar{x}$	SD	level
1.Building technical, cognitive	4.72	0.54	Highest
2.Building interpersonal skills to prepare students for immediate and long-term industry demands	4.53	0.61	Highest
3.Technical skills training hands-on experience with industrial tools, software, and machinery.	4.35	0.55	High
4. Soft skills enhancement by programs focusing on communication.	3.22	0.57	Moderate
5.Teamwork, and critical thinking, certification and micro-credentials industry-recognized certifications in specialized areas	4.62	0.64	Highest
6.Ensures students are workforce-ready upon graduation.	3.19	0.51	Moderate
7.Addresses specific skill gaps identified by employers	3.33	0.55	Moderate
8.Promotes innovation and adaptability in graduates.	4.01	0.59	High
Total	**3.99**	**0.57**	**High**

Journal of Information Systems Engineering and Management
2025, 10(36s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Tables 4.3 to 4.6 present the analysis of four key dimensions in integrating production and education at GDUT. Table 4.3 shows that Work-Based Learning is implemented at a high level ($\bar{x}$ = 4.28), with the highest ratings for giving students real-world challenges, internships, and insights into workplace culture. Table 4.4 indicates that Curriculum Alignment is also strong ($\bar{x}$ = 4.15), especially in involving industry experts and aligning content with market needs, though support for lifelong learning scored lower. Table 4.5 reflects that Industry-Institution Partnerships are rated moderately ($\bar{x}$ = 3.73), with strong collaborative relationships but weaker performance in areas like co-delivered courses and technology transfer. Table 4.6 reveals that Skill Development is generally effective ($\bar{x}$ = 3.99), with high scores in technical and interpersonal skills, though moderate ratings in soft skills and workforce readiness highlight areas for improvement. Overall, GDUT aligns education well with industry needs, though targeted partnership enhancements and soft skills training are recommended.

In the qualitative phase, semi-structured interviews were conducted with nine experts—four GDUT deans, four industry representatives, and one academic scholar—to gather insights on effective strategies for integrating production and education. The analysis focused on four core areas: work-based learning, curriculum alignment, industry-institution partnerships, and skill development.

In the work-based learning aspect, all experts emphasized the importance of hands-on training, real-world project engagement, and establishing industrial training centers within universities. Programs such as internships, apprenticeships, and co-op learning were highlighted as essential for bridging academic learning with industry practice.

The experts agreed on the need to co-develop curricula with industry partners, incorporate emerging technologies, and adopt competency-based learning outcomes for curriculum alignment. This ensures that educational content remains relevant to current and future labor market needs.

Regarding industry-institution partnerships, experts advocated a dual education model combining academic and practical training. They stressed the value of strong collaboration through joint teaching, mentorship by industry professionals, and regular workshops and industry visits.

Finally, in the area of skill development, experts recommended strengthening entrepreneurial education, supporting student-led innovations, and providing industry-recognized certifications. They also called for competency-based assessments and continuous feedback loops involving students, educators, and employers.

Together, these expert insights offer actionable guidelines for enhancing GDUT's integration of production and education, aligning its educational offerings with evolving industry demands.

Research Discussion

Discussion for Research Objective 1
To assess the current state of integration between theoretical education and practical industrial training at GDUT.

The assessment of the current state of integration between academic instruction and practical industrial training at Guangdong University of Technology (GDUT) revealed an overall high level of implementation across four key dimensions: work-based learning, curriculum alignment, industry-institution partnerships, and skill development. These findings suggest that GDUT has made

Journal of Information Systems Engineering and Management
2025, 10(36s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

commendable strides in aligning its educational model with the demands of a modern, innovation-driven economy.

Work-Based Learning (WBL) emerged as the most developed area ($\bar{x}$ = 4.28), indicating strong implementation of internships, apprenticeships, cooperative programs, and real-world industrial projects. Students are being exposed to practical learning environments and gaining valuable experience under professional supervision. These findings reflect the assertions of Amest and Claro (2021), who emphasized that hands-on experiences in workplace settings enhance problem-solving abilities and promote familiarity with industry-specific practices and cultures.

Curriculum Alignment also scored highly ($\bar{x}$ = 4.15), with particular strengths in involving industry experts in curriculum design and ensuring that educational outcomes reflect real labor market demands. This aligns with the observations of Wang, Lu, and Zhang (2021), who argued that updating curricula to match current industrial and technological trends is critical for preparing students for future employment.

However, Industry-Institution Partnerships, while still rated at a high level ($\bar{x}$ = 3.73), received the lowest mean score among the four dimensions. The data showed that although collaborative relationships between GDUT and industry exist, aspects such as co-delivered courses, technology transfer, and consistent advisory roles for industry experts remain underdeveloped. This is consistent with the findings of Sirathanakul et al. (2023) and Jing (2019), who noted that structural and organizational boundaries often inhibit sustained collaboration between higher education institutions and industry stakeholders. Additionally, Etzkowitz (2004) emphasized that for such partnerships to be effective, universities must move beyond traditional roles and actively engage with industrial and governmental entities through structured, institutionalized frameworks.

In the area of Skill Development, the mean score ($\bar{x}$ = 3.99) indicated strong implementation, particularly in technical and cognitive skills. However, moderate scores were observed in soft skills such as communication, teamwork, and adaptability. These results align with Fan (2023), who pointed out that the growing complexity of industrial jobs in China demands not only technical proficiency but also the development of soft and transferable skills, which remain a challenge in traditional vocational models.

Overall, while GDUT has successfully laid the groundwork for practical and industry-aligned education—especially through WBL and curriculum reform—gaps remain in building deeper, sustained industry partnerships and addressing the full spectrum of skill development. The findings reinforce the necessity for a more integrated and collaborative approach that includes curriculum co-design, joint training platforms, and systematic feedback loops between academia and industry.

Discussion for Research Objective 2

To develop clear, actionable guidelines that align GDUT's undergraduate programs with the needs of the industrial sector.

The second objective of this study focused on formulating practical strategies to enhance the integration of production and education at Guangdong University of Technology (GDUT). Drawing from semi-structured interviews with nine experts—including university deans, industry leaders, and a senior academic—the research identified targeted guidelines across four key dimensions: work-based learning, curriculum alignment, industry-institution partnerships, and skill development.

Journal of Information Systems Engineering and Management
2025, 10(36s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

In the area of Work-Based Learning, experts unanimously supported the adoption of project-based and problem-solving approaches. Recommendations included expanding apprenticeships, internships, and cooperative programs and creating industrial training centers within the university. These centers would provide simulated environments where students could engage with real-world challenges in collaboration with industry mentors. This aligns with the work of Wang et al. (2023), who emphasized that project-based teaching and hands-on experiences serve as critical pedagogical strategies in bridging the gap between classroom theory and industrial practice.

For Curriculum Alignment, experts proposed the co-development of course content with industry professionals to ensure that educational outcomes reflect emerging technologies, job market trends, and future skill needs. Specific strategies included integrating competency-based objectives and emphasizing interdisciplinary knowledge. This recommendation supports the findings of Wang, Lu, and Zhang (2021), who argued that continuous collaboration between academia and industry is essential for keeping curricula relevant and responsive to technological advancements.

Industry-Institution Partnerships were also addressed in-depth. Experts called for the implementation of a dual education model, where students alternate between academic instruction and hands-on industrial training. They also recommended formalizing long-term collaborations through co-delivered courses, industry-funded research projects, and regular industry workshops. These insights extend Etzkowitz's (2004) Triple Helix model by proposing structural mechanisms for institutionalized collaboration between universities, industries, and government entities. Similarly, Wongmajarapinya et al. (2024) and Jing (2019) highlighted the importance of overcoming institutional silos to create sustainable partnerships that foster innovation and workforce readiness.

Regarding Skill Development, the proposed guidelines focused on equipping students with technical expertise and soft skills. Experts emphasized entrepreneurial support, critical thinking, communication, and teamwork. They also advocated for industry-recognized certification programs and competency-based assessments developed in collaboration with employers. These insights align with Fan (2023), who noted that addressing skill gaps and promoting adaptability are essential for preparing graduates for China's rapidly evolving industrial economy.

Importantly, the use of digital technologies such as AI, big data analytics, and blockchain for curriculum feedback, student progress tracking, and internship evaluation was also recommended. These tools can support dynamic, data-driven decision-making and continuous improvement, as supported by Wang et al. (2023), who advocated for digital transformation in education to enhance integration and responsiveness.

In summary, the expert interviews provided a rich foundation for developing actionable and evidence-based guidelines that support GDUT in strengthening its role as a provider of workforce-ready graduates. These guidelines not only respond to the current challenges identified in the quantitative phase but also position the institution to meet future demands through strategic partnerships, curriculum innovation, and skill-focused training.

Research Recommendations

Recommendations for Implementation

1. Research Result – Work-Based Learning: Work-based learning is implemented at a high level, especially through internships and cooperative programs; however, integration with real-industry

Journal of Information Systems Engineering and Management
2025, 10(36s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

challenges and structured feedback remains limited. Recommendation: GDUT academic departments, in collaboration with Career Services and industry partners, should expand and formalize internship programs by establishing standard agreements, supervision protocols, and a digital tracking platform. This will ensure consistent, high-quality workplace learning and enhance graduate readiness.

2. Research Result – Curriculum Alignment: Curricula generally align with industry needs, but gaps exist in soft skill development and lifelong learning content. Recommendation: Curriculum committees, supported by industry advisory boards, should annually revise curricula through co-design workshops to integrate interdisciplinary content, practical competencies, and emerging industry trends. This ensures programs remain relevant and responsive to market demands.

3. Research Result – Industry-Institution Partnerships: Partnerships are present but weak in areas such as co-teaching, collaborative research, and knowledge exchange. Recommendation: University leadership and the External Relations Office should formalize long-term partnerships with industry through MOUs covering joint course delivery, mentorship, and shared infrastructure. This creates sustained collaboration and mutual value.

4. Research Result – Skill Development: Technical and cognitive skills are strong, but the development of soft skills, adaptability, and entrepreneurship is moderate. Recommendation: Faculty and industry trainers should implement soft skills workshops, innovation projects, and certification programs supported by incubation centers. This fosters balanced skillsets and promotes workforce adaptability.

5. Research Result – Digital Integration: There is a need for digital tools to support and monitor education-industry integration.

Recommendation: The university's IT department, with academic leadership, should develop a digital platform using AI and data analytics to track internships, update curricula, and assess competencies. This enables continuous improvement and informed decision-making.

Recommendations for Future Research

1. Broaden the Institutional Scope

Future studies may consider including additional universities with varying characteristics to explore how integration models function in different institutional contexts. This could enhance the applicability of the research framework and reveal broader trends.

2. Incorporate Diverse Stakeholder Perspectives

While this study focused on faculty and expert input, future research could benefit from including student and employer perspectives to capture a more holistic view of the integration process and its perceived effectiveness.

3. Explore Long-Term Impact

A longitudinal approach may offer valuable insights into how integration strategies develop and sustain effectiveness over time. This could help identify long-term outcomes related to student employability and industry engagement.

Journal of Information Systems Engineering and Management
2025, 10(36s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

4. Investigate Digital Tools in Practice

Further research might explore the implementation and impact of digital technologies—such as AI-driven systems for curriculum updates or internship tracking—to better understand their role in supporting integration efforts.

5. Examine Policy and Governance Support

Studying the influence of education policy and governance structures could provide useful context for how institutional efforts align with broader system-level strategies for industry-education collaboration.

6. Pilot and Evaluate Implementation Guidelines

Future studies could apply and assess the practical guidelines developed in this research within specific academic programs or departments, helping to refine their usability and measure their impact on educational and employment outcomes.

Conclusion

This research examined the integration of production and education through practical teaching and application-oriented learning within the undergraduate programs of Guangdong University of Technology (GDUT). Employing a mixed-methods approach, the study assessed the current implementation of work-based learning, curriculum alignment, industry-institution partnerships, and skill development. Quantitative findings revealed that GDUT has achieved a generally high level of integration, with work-based learning emerging as the strongest area, while industry partnerships showed room for improvement. Qualitative insights from expert interviews further highlighted the importance of collaboration, innovation, and curriculum relevance in aligning education with industry needs.

Based on these findings, the study proposed practical, evidence-based guidelines aimed at strengthening each dimension of integration. These include expanding internship programs, co-developing curricula with industry input, formalizing partnerships, and enhancing both technical and soft skills training. The research contributes to the ongoing discourse on vocational education reform by offering a structured framework that supports institutional responsiveness to labor market demands. Ultimately, this study underscores the need for sustained collaboration among universities, industry, and policymakers to ensure that graduates are well-prepared for the evolving challenges of the modern workforce.

References

[1] Amest, I., & Claro, J. M. (2021). Work-based learning in higher education: Improving graduate employability through industry engagement. Journal of Vocational Education and Training, 73(2), 189–205. https://doi.org/10.1080/13636820.2020.1726945

[2] Cai, Y. (2021). Bridging academic and industrial knowledge: A framework for university industry collaboration in China. Tertiary Education and Management, 27(3), 281–298. https://doi.org/10.1007/s11233-021-09068-z

[3] Etzkowitz, H. (2004). The evolution of the entrepreneurial university. International Journalof Technology andGlobalisation,1(1),64-77. https://doi.org/10.1504/IJTG.2004.004551

[4] Damrongsiri, T., Harnphanich, B., Songtaweeporn, T., & Channuwong, S. (2022). Leadership of administrators for improving missions implementation of Thai private higher education institutions. Journal of Positive School Psychology, 6(9), 2558-2568.

[5] Fan, H. (2023). Skill mismatch and the future of vocational education in China. Chinese Education & Society, 56(1), 25–39. https://doi.org/10.1080/10611932.2023.2174432
[6] Jing, Y. (2019). Vocational education transformation in the era of digital economy: A multi-stakeholder collaboration perspective. Vocational and Technical Education Research, 38(4), 14–19.
[7] Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. Educational and Psychological Measurement, 30(3), 607–610.
[8] Liao, M., & Tang, S. (2021). Application-oriented education reform at GDUT: Challenges and pathways. Journal of Higher Education Research, 44(2), 65–72.
[9] Journal of Posthumanism, 5(3), 815-827. https://doi.org/10.63332/joph.v5i3.791
[10] Sirathanakul, K., Harnpanich, B., Channuwong, S., Bangbon, P., Niangchaem, L., Sutthadaanantaphokin, K. (2023). The influence of human resource management on educational administration of Thai Private Universities. Migration Letters, 20 (S1), 423-436.
[11] Tirakanan, C. (2007). Development of educational research instruments. Bangkok: Chulalongkorn University Press.
[12] Wang, Y., Lu, H., & Zhang, M. (2021). Curriculum co-design and industry collaboration in vocational higher education: A case study from China. International Journal of Educational Development, 86, 102464. https://doi.org/10.1016/j.ijedudev.2021.102464
[13] Wang, Z., Liu, T., & Chen, J. (2023). Digital transformation of vocational education in China: From policy to practice. Educational Technology Research and Development, 71(1), 113–130. https://doi.org/10.1007/s11423-022-10115-9
[14] Wongmajarapinya, K., Channuwong, S., & Pratoomsawat, T. (2024). The model of modern management influencing sustainable organization development of Thai Smile Bus Company Limited. Migration Letters, 21(S2), 385-399.
[15] Yang, R. (2014). The transformation of vocational education and training in China: Deep integration with industry. Chinese Journal of Vocational and Technical Education, 40(3), 25–32.
[16] Zeng, Y. (2021). Mismatch between university curriculum and labor market needs: Evidence from Guangdong Province. Journal of Chinese Education Policy, 36(1), 48–55.
[17] Zhang, X. (2019). Barriers to effective university–industry collaboration in vocational education. Asia-Pacific Education Review, 20(3), 429–442. https://doi.org/10.1007/s12564-019-09605-7