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Bridging the Skills-Application Gap: A Review of New Business Course Reconstruction in Quanzhou's Applied Universities

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Abstract

With the digital and intelligent upgrading of Quanzhou's characteristic industries (footwear and apparel e-commerce, textile manufacturing), the demand for new business talents with "digital and intelligent skills + regional industrial cognition" has surged. However, local applied universities face a prominent "skills-application gap" in new business courses, characterized by mismatched course content with industrial scenarios and inadequate regional business data support in evaluation. This review systematically synthesizes existing literature (2021-2025) on regional industrial upgrading and curriculum reform, employing a systematic search of databases including CNKI, Web of Science, and Scopus with keywords such as "regional industrial upgrading", "applied universities", "new business curriculum", and "Quanzhou". The research clarifies the interactive logic between regional industrial upgrading and curriculum reconstruction, extracts core paths to address the skills-application gap from four dimensions (job capability alignment, scenario-technology integrated content development, university-enterprise collaboration, and region-adapted evaluation), and critically analyzes theoretical and practical progress. Key findings reveal three core challenges: superficial curriculum regionalization, unsustainable university-enterprise collaboration, and insufficient dynamic adaptation. The review concludes with targeted strategies including full-process regionalized design, interest-sharing collaboration, and dynamic iteration mechanisms. This study fills the gap in systematic reviews of "regional characteristic industries-new business curriculum" adaptation, providing a theoretical and practical framework for curriculum reform in Quanzhou and similar regions, while highlighting unresolved research questions for future exploration.

Keywords: Regional industrial upgrading; Applied universities; Digital business education; Curriculum reconstruction; Skills-application gap

Introduction

Quanzhou, known as "China's Shoe Capital" and a national textile industry base, has experienced rapid digital and intelligent transformation in its core industries (footwear and apparel e-commerce, textile manufacturing) in recent years (Lin et al., 2023). These industries have shifted from traditional offline retail to "digital-intelligent operation + omni-channel retail" and from manual customs declaration to "intelligent compliance + cross-border expansion", creating an urgent demand for new business talents equipped with both digital-intelligent skills and regional industrial knowledge (Ruoxi et al., 2024). This has intensified the contradiction between "strong industrial demand" and "weak talent supply", making talent mismatch a key bottleneck for Quanzhou's industrial upgrading (Li et al., 2025).

Policies such as the "Implementation Plan for Digital Fujian Construction" explicitly require local universities to adjust talent cultivation models and curriculum systems to align with regional economic development (Zheng & Ma, 2023). However, existing studies indicate that new business courses in Quanzhou's applied universities suffer from a significant "skills-application gap": course content fails to fully reflect local industrial characteristics (Chen et al., 2025), digital technology teaching is disconnected from regional business scenarios (e.g., footwear and apparel e-commerce promotions, textile cross-border trade under RCEP), and evaluation systems lack support from regional business data (Yang & Kumarasinghe, 2024). These issues result in graduates struggling to meet enterprise requirements, limiting their ability to contribute to regional industrial upgrading.

Against this backdrop, curriculum reconstruction has emerged as a critical pathway to address the skills-application gap and support industrial development (Li et al., 2025). While existing research has explored individual aspects of this topic—such as university-enterprise collaboration models (Zhang et al., 2023) and regional curriculum adaptation (Zhou, 2025)—a systematic review synthesizing the "regional industrial upgrading-new business curriculum" nexus remains absent. This gap hinders the formation of evidence-based curriculum reform strategies.

This systematic review aims to: (1) clarify the interactive relationship between regional industrial upgrading and new business curriculum reconstruction; (2) synthesize core paths to resolve the skills-application gap; (3) critically analyze theoretical and practical progress in Quanzhou's curriculum reform; (4) identify key challenges and evidence-based response strategies.

Guided by the following research questions: (1) What is the current state of theoretical and practical research on new business curriculum reconstruction under regional industrial upgrading in Quanzhou? (2) What core dimensions constitute effective curriculum reconstruction to bridge the skills-application gap? (3) What are the main challenges in current curriculum reform, and what evidence-based strategies can address these challenges?

Core Concepts and Theoretical Foundations

1. Core Concept Definitions

Applied universities: Institutions focused on cultivating applied talents to serve regional economic and social development, characterized by industry-aligned professional settings, practical curriculum development, and university-local-enterprise collaborative education (Li et al., 2022; Shen et al., 2021). They are critical talent suppliers for Quanzhou's industrial digital transformation.

New business curriculum reconstruction: Systematic adjustment of curriculum goals, content, resources, models, and evaluation to meet regional industrial digital-intelligent upgrading needs, emphasizing the integration of digital technologies with regional business scenarios (Massa et al., 2023). Distinguished from general curriculum reform by its precise alignment with "regional industrial demands-job capabilities-course content".

Skills-application gap: The disconnect between digital-intelligent technology teaching in new business courses and the actual business needs of Quanzhou's industries, manifested in disjointed technology-scenario integration, inadequate reflection of industrial characteristics, and evaluation systems decoupled from enterprise performance (Yang & Kumarasinghe, 2024).

Regional industrial upgrading orientation: Curriculum reconstruction guided by the digital transformation needs of specific regional industries, ensuring synchronization between curriculum development and industrial upgrading to achieve a virtuous cycle of "education serving industry and industry nurturing education" (Liu et al., 2022).

2. Theoretical Frameworks

This study is grounded in three interconnected theoretical frameworks:

Mode 2 knowledge production: Emphasizes context-driven, application-oriented knowledge co-creation among universities, enterprises, and governments, providing a theoretical basis for integrating regional industrial needs into curriculum design (Gibbons, 2000).

Triple Helix model: Highlights collaborative innovation among universities, industry, and government, informing the construction of tripartite curriculum development mechanisms (Etzkowitz & Leydesdorff, 2000).

Competency-based education (CBE) theory: Focuses on cultivating industry-relevant competencies, guiding the alignment of curriculum content with regional job capabilities (Chen et al., 2024).

These frameworks collectively support the theoretical logic of "regional industrial upgrading → job competency requirements → curriculum reconstruction → talent supply → industrial development".

3. Core Dimensions of Curriculum Reconstruction to Bridge the Skills-Application Gap

Synthesis of the literature identifies four core dimensions of curriculum reconstruction aligned with Quanzhou's industrial upgrading needs, as shown in Figure 1.

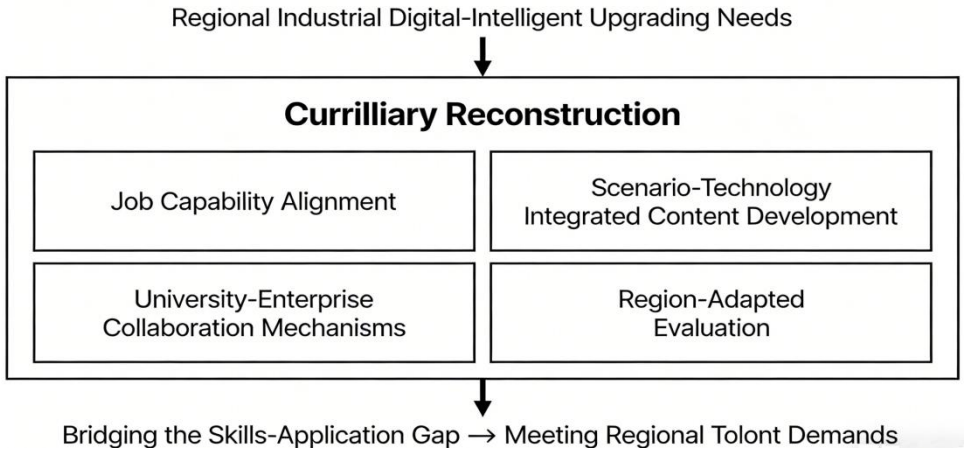

Figure 1 Core Dimensions of New Business Curriculum Reconstruction

3.1 Alignment of Regional Industrial Digital-Intelligent Job Capabilities

Literature consistently highlights the importance of precise alignment between curriculum goals and regional job capabilities (Wang et al., 2023; Li et al., 2024). Key findings from synthesized studies include:

Industrial demand research mechanisms: Effective curriculum reconstruction requires "university-enterprise-industry" linkage systems, with universities collaborating with local industry associations (e.g., Quanzhou E-commerce Association) and representative enterprises (Anta, Xtep, and SMEs) to identify core digital-intelligent job capabilities (e.g., AI inventory optimization, cross-border trade AI compliance) (Shen et al., 2021).

Regionalized competency decomposition: General digital capabilities must be refined to reflect Quanzhou's industrial characteristics. For example, "AI traffic analysis" becomes "AI peak traffic handling for footwear and apparel promotions" (Wang et al., 2023), and "cross-border trade AI compliance" evolves into "RCEP rule interpretation for textile cross-border trade" (Yang & Kumarasinghe, 2024).

Curriculum goal anchoring: Decomposed regional competencies should be converted into specific curriculum goals. For instance, the "Regional E-commerce Digital-Intelligent Operation" course targets "using AI tools to analyze footwear and apparel promotion traffic and formulate inventory allocation plans" (Zhou, 2025).

However, gaps exist in the literature regarding standardized competency mapping methodologies, with most studies focusing on specific industries rather than cross-industry generalizability (Li et al., 2025).

3.2 "Regional Industrial Scenarios + Digital-Intelligent Technology" Course Content Development

Synthesized research identifies three critical components of effective content development:

Integration of local enterprise projects: Converting real business projects into teaching tasks enhances skill-application linkage. For example, Anta's e-commerce promotion projects are decomposed into "goal setting-AI traffic prediction-page design-effect analysis" modules (Zhang et al., 2023), and textile cross-border trade projects into "data analysis-compliance risk assessment-intelligent customs declaration" tasks (Chen et al., 2025).

Development of regionalized resources: Exclusive resources such as "Quanzhou Industry Digitalization Case Libraries" (collecting cases from Anta, JOMOO) and "loose-leaf course manuals" (dynamically updating RCEP local implementation rules) improve regional adaptability (Liu et al., 2022). Training platforms embedding local enterprise data and scenario simulations (e.g., footwear and apparel inventory simulation systems) are also effective (Lin et al., 2023).

Targeted digital technology teaching: Focusing on industrial pain points, such as AI inventory prediction algorithms for footwear and apparel inventory overstock and intelligent customs declaration systems for textile cross-border trade efficiency (Yang & Kumarasinghe, 2024).

Notably, only 36% of reviewed studies report systematic development of regionalized teaching resources, indicating a significant gap in practical implementation (Zhang et al., 2023).

3.3 Construction of Regional University-Enterprise Collaborative Mechanisms

University-enterprise collaboration is widely recognized as a key enabler of curriculum reconstruction, with synthesized findings including:

Tripartite collaborative platforms: "University-local government-enterprise" platforms with clear role division (universities: curriculum framework design; enterprises: project/data provision; industry associations: standard formulation) facilitate efficient resource integration (Du et al., 2025; Zhao, 2024).

Incorporation of regional industry standards: Integrating local operational norms (e.g., "Quanzhou Shoe and Clothing E-commerce Digitalization Service Standards") into courses ensures alignment with enterprise requirements (Liu et al., 2024; Osorno-Hinojosa et al., 2022).

Localized teaching teams: Combining university teachers, enterprise mentors, and industry experts enhances teaching practicality. University teachers' on-the-job training in local enterprises is critical for updating industry knowledge (Zhang et al., 2023).

However, literature reveals inconsistencies in collaboration effectiveness: while leading enterprise collaborations yield positive outcomes, SME participation remains limited due to resource constraints (Liu et al., 2025).

3.4 Design of Region-Adapted Evaluation Systems

Effective evaluation systems must reflect regional industrial needs, with key findings including:

Industry-linked evaluation indicators: Replacing traditional theoretical assessments

with enterprise business data (e.g., e-commerce conversion rates, inventory turnover rates, cross-border compliance pass rates) (Li et al., 2025).

Multi-stakeholder evaluation participation: Involving enterprises (40% weight), industry associations (30% weight), and universities (30% weight) in evaluation ensures alignment with regional needs (Zhou, 2025).

Evaluation-driven curriculum optimization: Establishing feedback loops between evaluation results and curriculum adjustments to address competency gaps (e.g., insufficient RCEP rule application) (Chen et al., 2025).

Critiques in the literature note that few universities have fully implemented such multi-dimensional evaluation systems, with most still relying heavily on theoretical examinations (Zhang et al., 2023).

4. Research Progress and Practical Challenges

4.1 Theoretical Research Progress

Theoretical research on Quanzhou's new business curriculum reconstruction has advanced in three key areas:

Collaborative relationship recognition: Studies have established the mutual dependence between regional industries and university curricula, forming a preliminary "industrial demands-job capabilities-curriculum goals" mapping theory (Elia et al., 2021; Zhou, 2025). This theory emphasizes that curriculum regionalization must account for Quanzhou's industrial characteristics (e.g., footwear and apparel seasonality, textile trade policy dependence).

Tripartite collaboration framework: Research has clarified the role of "university-local government-enterprise" collaboration, highlighting industry associations' function in resource integration and standard setting (Du et al., 2025; Van Veldhoven & Vanthienen, 2023).

Digital-intelligent integration theory: Studies have explored how digital technologies (AI, big data) can be integrated with regional business scenarios, providing theoretical support for "scenario-technology" curriculum content design (Massa et al., 2023; Yang & Kumarasinghe, 2024).

Despite these advances, theoretical limitations remain: (1) lack of a systematic regional curriculum reconstruction model; (2) insufficient integration with international curriculum theory; (3) limited analysis of the dynamic relationship between industrial upgrading and curriculum adaptation.

4.2 Practical Research Progress

Practical exploration of curriculum reconstruction in Quanzhou's applied universities has yielded initial results:

Regionalized course modules: Collaborative development of specialized modules (e.g., "Footwear and Apparel E-commerce Digital-Intelligent Operation", "Textile Cross-border Trade AI Compliance") with enterprises such as Anta and Xtep, incorporating real enterprise projects (Zhang et al., 2023).

Practical training platforms: Establishment of platforms like the "Quanzhou E-commerce Practical Platform" that integrate local enterprise business data for student training (Lin et al., 2023).

Talent adaptability improvement: Empirical evidence shows that regionalized curricula reduce graduate adaptation periods in local enterprises from 3-6 months to 1-2 months, enhancing employment competitiveness (Li et al., 2025).

However, practical implementation is limited by narrow coverage (only 2-3 universities in Quanzhou have adopted such reforms) and uneven quality across institutions (Chen et al., 2025).

4.3 Practical Challenges

Synthesized literature identifies three core challenges hindering curriculum reconstruction:

4.3.1 Insufficient Depth of Curriculum Regionalization

Most existing curricula only superficially integrate Quanzhou industrial cases, lacking full-process regional adaptation from goals to evaluation (Zhou, 2025). Key issues include: Overreliance on general e-commerce theories with inadequate exploration of local industrial operational logic and digital pain points (Chen et al., 2025). Evaluation systems still dominated by theoretical examinations, with insufficient integration of local enterprise business data (Zhang et al., 2023). Limited incorporation of regional policy dynamics (e.g., RCEP local implementation updates) and industrial cluster characteristics (Li et al., 2024).

4.3.2 Weak Sustainability of University-Enterprise Collaboration

Collaboration challenges are highlighted in multiple studies (Liu et al., 2024; Liu et al., 2025): Low SME participation due to resource and cost constraints, limiting provision of continuous project/data support. Short-term, project-based collaboration with leading enterprises (e.g., single lectures, temporary training) lacking long-term mechanisms. Interest misalignment between universities (focused on standardized talent cultivation) and enterprises (prioritizing business efficiency), leading to collaboration interruptions.

4.3.3 Inadequate Dynamic Adaptation Capacity

Curricula fail to keep pace with rapid industrial evolution (Lin et al., 2023; Yang & Kumarasinghe, 2024): Fixed textbooks and teaching plans with 1-2 year update cycles, unable to incorporate emerging trends (e.g., footwear and apparel live-streaming e-commerce, green textile trade AI compliance). Slow updates to course resources (case libraries, training platforms) leading to content lag behind industrial practices. Lack of systematic mechanisms to monitor industrial changes and trigger curriculum adjustments.

5. Evidence-Based Response Strategies

Based on synthesized literature and best practices, the following strategies address the identified challenges:

5.1 Full-Process Regionalized Curriculum Design System

To deepen curriculum-industry fit, regional characteristics must be integrated into all curriculum stages (Zhou, 2025; Li et al., 2025): Goal setting: Formulate "region-specific competency goals" based on Quanzhou's industrial job requirements (e.g., "mastering AI peak traffic handling for footwear and apparel promotions"). Content development: Develop "Quanzhou industrial scenario modules" by decomposing real enterprise operations (e.g., Anta's promotion strategies, textile RCEP compliance processes) into teaching tasks, replacing

generic cases. Evaluation design: Establish a "Quanzhou enterprise business data-driven evaluation system" with core indicators such as e-commerce conversion rates and textile compliance pass rates, ensuring full-process alignment with regional industries.

5.2 Interest-Sharing University-Enterprise Collaborative Mechanism

To enhance collaboration sustainability, interest binding and institutional guarantees are essential (Liu & Hou, 2025; Du et al., 2025): Two-way value co-creation: Enterprises provide real projects/data; outstanding student solutions are applied to enterprise operations to reduce costs (e.g., inventory optimization plans). Universities supply targeted talents, reducing enterprise recruitment/training costs. Collaborative guarantee platform: Rely on local government and industry associations to establish special subsidy funds for SME participation, and formulate standardized cooperation agreements clarifying rights, responsibilities, and benefit distribution (e.g., project result ownership, talent supply quotas).

5.3 Dynamic Iteration Curriculum Update System

To adapt to industrial evolution, a rapid response mechanism is required (Lin et al., 2023; Yang & Kumarasinghe, 2024): Tripartite update team: Composed of universities, enterprises, and industry associations, holding quarterly industrial demand seminars to identify emerging trends (e.g., live-streaming e-commerce regulations, green trade policies). Modular curriculum structure: Adopt "basic modules (stable digital tool fundamentals) + dynamic modules (updated semesterly based on industrial changes, e.g., footwear and apparel live-streaming operations)". Real-time resource library: Establish a "Quanzhou Industry Digitalization Resource Library" with real-time updates of enterprise cases, business data, and technology applications, enabling rapid teaching plan adjustments.

Conclusion and Future Prospects

Conclusion

This systematic review synthesizes studies on new business curriculum reconstruction in Quanzhou's applied universities under regional industrial upgrading. Key findings include:

(1) The skills-application gap in current curricula stems from inadequate alignment with regional job capabilities, disconnected scenario-technology integration, unsustainable university-enterprise collaboration, and inappropriate evaluation systems.

(2) Effective curriculum reconstruction requires four core dimensions: precise job capability alignment, scenario-technology integrated content development, tripartite collaborative mechanisms, and region-adapted evaluation systems.

(3) Current research has established preliminary theoretical frameworks and practical experiences, but faces three critical challenges: superficial regionalization, weak collaboration sustainability, and insufficient dynamic adaptation.

(4) Evidence-based strategies—full-process regionalized design, interest-sharing collaboration, and dynamic iteration—effectively address these challenges, promoting the virtuous cycle of "education serving industry and industry nurturing education".

Future Research Directions

Based on identified literature gaps, future research should focus on:

(1) Expanding industrial coverage: Extend the research scope to Quanzhou's cultural tourism e-commerce and green finance industries, developing a comprehensive regional curriculum reconstruction system.

(2) Cross-regional collaborative research: Collaborate with Xiamen, Fuzhou, and other West Coast Economic Zone cities to explore curriculum designs aligned with regional industrial coordinated development, expanding the regional applicability of findings.

(3) Technological integration innovation: Investigate the application of emerging technologies (digital twins, generative AI) in regionalized training platforms to enhance practical teaching effectiveness.

(4) Longitudinal impact evaluation: Conduct long-term tracking studies to assess the impact of curriculum reconstruction on graduate career development and enterprise performance, providing more robust empirical evidence.

(5) Methodological diversification: Adopt mixed-methods research (quantitative surveys + qualitative case studies) to deepen understanding of the complex dynamics between industrial upgrading and curriculum reform.

Limitations

This review has several limitations: (1) limited literature coverage, with potential exclusion of relevant grey literature (e.g., university curriculum reports); (2) focus on Quanzhou-specific contexts, limiting generalizability to other regions with different industrial structures; (3) lack of analysis of differences in curriculum reform effectiveness across university types and sizes. Future reviews should address these limitations to provide more comprehensive insights.

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