

Research on the Digital Talent Cultivation Pathways in Wenzhou Higher Vocational Colleges under the Digital Economy Background

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Abstract: Against the backdrop of the digital economy becoming a new engine for national economic growth, Wenzhou, as a leading region in digital economy development, is actively exploring digital transformation to drive industrial upgrading. However, the city faces challenges including structural employment contradictions and an expanding digital talent gap. This paper analyzes the current status of Wenzhou's digital economy, highlighting progress in enterprise digital transformation and government policy support while identifying challenges in digital talent cultivation. To address these issues, the study proposes pathways for Wenzhou's higher vocational colleges to enhance digital talent cultivation through strengthened industry-academia collaboration, innovative training models, deeper integration with real-world industries, and curriculum system reforms. These measures aim to improve educational quality, bridge the digital talent supply-demand gap, and promote high-quality economic development in Wenzhou.

Keywords: Digital Economy; Digital Talent Cultivation; Higher Vocational Education.

1. Background and Significance of the Project

The digital economy has emerged as a pivotal driver of national economic growth. As a frontrunner in digital economy development, Wenzhou is pursuing industrial upgrading through digital reforms. Nevertheless, the city currently grapples with structural employment mismatches and a widening digital talent shortage.

Wenzhou's higher vocational colleges, serving as hubs for cultivating technical and skilled professionals, face the dual challenges of enhancing training capacity and adaptability to produce high-quality digital talent aligned with socio-economic demands. There is an urgent need to improve educational quality, optimize the digital talent supply-demand relationship, strengthen industry-academia collaboration, and explore localized talent cultivation models. Such efforts will better align education with industrial needs, provide robust talent support for Wenzhou's digital economy, and accelerate high-quality industrial and economic development [1].

2. Current Status of Wenzhou's Digital Economy Development

Wenzhou is advancing new industrialization through intelligent transformation and digitalization to develop advanced productivity. During the 13th Five-Year Plan period (2016-2020), Wenzhou's digital economy reached an added value of approximately 325 billion Yuan, accounting for 47.1% of GDP. Core industries achieved an added value of 47.8 billion yuan, marking a 64.8% increase from 2015.

2.1. Proactive Digital Transformation by Enterprises

Wenzhou enterprises are investing in intelligent technological upgrades (e.g., hardware automation and software informatization) to enhance competitiveness. Electrical equipment manufacturers, for instance, are

prioritizing R&D to boost production efficiency and meet market demands.

Meanwhile, Wenzhou enterprises confront three critical challenges in their digital transformation:

- **Strategic Ambiguity:** The absence of well-defined digital transformation objectives and strategies necessitates a structured roadmap encompassing strategic priorities, performance metrics, and growth methodologies.
- **Managerial Gaps:** Inadequate digital governance capabilities and interdepartmental collaboration bottlenecks require strengthened professional expertise in digital business relationship management [2].
- **Cultural Resistance:** Limited digital culture penetration has engendered internal resistance, compounded by insufficient employee training on digital literacy. Uncertainty about role evolution has reduced workforce willingness to embrace new technical competencies or operational responsibilities.

2.2. Government Policy Support

The Wenzhou municipal government prioritizes digital economy development as a "No.1 Project", implementing supportive policies such as technology renovation subsidies and digital transformation awards. Infrastructure initiatives include the 5G "Hundred-Thousand" Action Plan for citywide 5G coverage and cloud computing centers. An innovation ecosystem integrating universities, research institutions, and industry leaders has taken shape. However, challenges persist in weak core industries, inadequate industrial park support, and insufficient resource allocation.

3. Wenzhou's Demand for Cultivating Digital Talent

Integrating the digital transformation needs of Wenzhou enterprises with existing government policy support, the demand for cultivating digital talent in Wenzhou is primarily reflected in the following aspects.

3.1. Needs of Industrial Cluster Development

Based on the differentiated development distribution of Wenzhou's industrial clusters, large-scale clusters have formed in key areas:

- Yueqing: Electronics components, automotive electronics, and IoT sensor industries.
- Lucheng and Ouhai: Software and information services, digital security industries.
- Ruian and Pingyang: Automotive electronics and intelligent equipment industries.

Most of Wenzhou's industrial clusters require digital talent concentrated in smart electronics and equipment-related fields. The growth of these industries has created an urgent demand for specialized digital professionals.

3.2. Industry-Academia-Research Collaboration

The current collaboration model between vocational colleges, industries, and research institutions in Wenzhou remains underdeveloped, leading to a disconnect between vocational education and industrial needs. Students' knowledge and skills may not fully align with actual enterprise requirements. To deepen the integration of educational resources and industrial demands, bridge theoretical knowledge with practical skills, and cultivate high-quality digital talent with both theoretical expertise and hands-on experience, Wenzhou's vocational colleges must enhance industry-academia-research collaboration. Such partnerships can establish a market-oriented, enterprise-led, and institution-supported collaborative mechanism, achieving a win-win scenario for talent cultivation and industrial development.

3.3. Integration of Digital and Real Economies

The digital economy is reshaping traditional industries, requiring vocational institutions to nurture talent capable of driving and adapting to digital transformation [3]. Equipped with hybrid expertise in both legacy systems and emerging technologies, such professionals are positioned to orchestrate intelligent transformation of traditional industries through automation and data-driven optimization, thereby elevating sectoral competitiveness in global value chains.

Key impacts of digital technology on traditional industries include:

(1) **Improved Production Efficiency:** Optimizing production processes through data analytics, IoT, and smart manufacturing reduces resource waste and enhances productivity and product quality.

(2) **Innovative Business Models:** Leveraging new concepts and technologies (e.g., e-commerce, sharing economy) helps businesses explore novel markets and value-creation methods.

(3) **Enhanced Industrial Chain Coordination:** Strengthening cross-chain collaboration via digital technologies optimizes resource allocation and improves efficiency and stability [4].

At the national strategic level, the integration of digital technologies with the real economy underscores the critical role of vocational institutions in cultivating digital talent, enabling enterprises to compete globally.

3.4. Digital Literacy and Skill Upgrading

Wenzhou's demand for digital talent also emphasizes

continuous updates to digital literacy and technical skills. Vocational institutions must keep pace with rapid technological advancements to cultivate professionals with interdisciplinary knowledge and skills.

- **Accelerated Skill Renewal:** Shorter technology cycles necessitate ongoing learning to keep up with innovation, requiring vocational colleges to align practical training with digital trends.

- **Cross-Disciplinary Competence:** Application of digital technologies across diverse industries demands expertise in data science, software development, cybersecurity, and other fields, raising the bar for talent cultivation.

This translation strictly adheres to the original text structure and content, with no additional data or external references included.

4. Recommendations for Digital Talent Cultivation Paths in Wenzhou's Vocational Colleges

4.1. Strengthen Industry Alignment and Industry-Education Integration

- **Close alignment with local industrial clusters:** Implement school-enterprise cooperation and work-study integration to ensure educational content aligns with industry demands.

- **Expand practical training opportunities:** Provide students with more internships and hands-on training to enhance practical skills and accelerate adaptation to enterprise digital transformation [1].

- **Select high-quality partners:** Collaborate with reputable, technologically advanced enterprises that possess mature management systems and innovation capabilities, ensuring students gain exposure to cutting-edge technologies and broad development prospects [5].

- **Build dual-qualified faculty teams:** Train and recruit full-time instructors with industry experience and digital skills to improve the teaching team's digital proficiency. Retain practitioners demonstrating innovative industrial insights as adjunct faculty to enrich teaching content and elevate educational quality [4].

4.2. Innovate Talent Cultivation Models

To foster innovation and entrepreneurship, Wenzhou's Vocational Colleges may encourage student participation in innovation projects and competitions to develop creative thinking and entrepreneurial capabilities.

- **Establish on-campus innovation project funds.** These funds would provide financial support for student-led innovation projects, allowing students to explore new ideas and technologies without the constraints of limited resources. By offering grants and seed funding, colleges can encourage students to take risks and pursue ambitious projects that could potentially lead to groundbreaking innovations. This financial backing can also attract external partners and investors, further enhancing the innovation ecosystem within the college.

- **Offer courses on innovative thinking and entrepreneurship, providing resources and guidance.** Integrating these courses into the curriculum ensures that students receive a comprehensive education that goes beyond traditional technical skills. Through lectures, workshops, and

mentorship programs, students can learn about the latest trends in innovation, business strategies, and market analysis. Access to experienced entrepreneurs and industry experts as guest speakers and mentors can provide valuable insights and practical advice, helping students navigate the challenges of starting and growing a business.

- **Create innovation labs and research centers to promote technological exploration.** These facilities serve as hubs for interdisciplinary collaboration, bringing together students from different fields to work on cutting-edge research and development projects. Equipped with state-of-the-art equipment and tools, innovation labs can support projects ranging from artificial intelligence and robotics to sustainable energy and biotechnology. By fostering a culture of experimentation and continuous learning, these centers can attract top talent and drive technological advancements that benefit both the local community and the broader industry.

- **Encourage community service and social practice to strengthen social responsibility and problem-solving skills.** Drawing from Singapore's SkillsFuture initiative, colleges could implement mandatory community digital literacy projects where students conduct 120-hour tech training for SMEs, earning micro-credentials recognized by the local commerce bureau. This approach not only enhances students' practical skills but also instills a sense of social responsibility by addressing real-world challenges faced by local businesses.

- **Integrate digital transformation courses to deepen students' understanding of industry applications.** As industries increasingly rely on digital technologies, it is crucial for vocational college students to be well-versed in the latest digital tools and platforms. Courses on digital transformation can cover topics such as data analytics, cloud computing, cybersecurity, and e-commerce, providing students with the skills needed to drive digital innovation in their future careers. By combining theoretical knowledge with practical case studies and hands-on projects, students can gain a holistic understanding of how digital technologies are reshaping industries and how they can contribute to this transformation [6].

4.3. Deepen Integration with the Real Economy

(1) Establish long-term school-enterprise partnerships: Jointly design curricula and training programs to enhance students' practical skills and career development.

- Use case studies and simulated operations to improve hands-on capabilities. This approach helps bridge the gap between academia and industry, enabling students to develop problem-solving skills and adaptability. In technical fields, simulated operations can provide hands-on experience with industry-standard tools and equipment, preparing students for the workplace.

- Invite enterprise experts as mentors for industry guidance and career advice [7]. It provides students with invaluable insights into the job market and career paths. These mentors can offer personalized guidance, share their experiences, and help students build professional networks. Regular interactions with mentors can also help students stay motivated and focused on their career goals. For instance, a mentor from a leading technology company could provide advice on emerging trends in software development and guide students on how to build a competitive portfolio.

- Synchronize course content with evolving skill requirements and establish feedback mechanisms to optimize

teaching programs. The rapid pace of technological advancements and changing industry demands requires educational institutions to continuously update their curricula. Regular reviews and updates to course content based on industry feedback can help students stay ahead of the curve and enhance their employability.

(2) Develop training bases aligned with industry workflows: Co-design training projects that match real-world enterprise skill demands [5].

- Conduct vocational skill training based on enterprise requirements to boost student competitiveness. For example, in the manufacturing sector, training programs can focus on precision engineering, quality control, and automation. This targeted approach not only enhances students' technical abilities but also makes them more attractive to potential employers. By demonstrating proficiency in industry-specific skills, students can differentiate themselves in the job market and secure better career opportunities.

- Support students in obtaining industry certifications to improve employability [8]. Industry certifications are often seen as a benchmark of competence and are highly valued by employers. By integrating certification preparation into the training programs, educational institutions can help students achieve these certifications. By obtaining these certifications, students can demonstrate their expertise and readiness for the workforce, giving them a competitive edge in the job market.

4.4. Innovate Curriculum Systems

Wenzhou's higher vocational colleges should regularly update course content to ensure alignment with the latest digital technologies, integrating skills in big data, AI, and cloud computing to strengthen technical application capabilities [9]. By continuously updating the curriculum, colleges can ensure that students are equipped with the most relevant and in-demand skills, preparing them for the challenges and opportunities of the digital age.

- Establish periodic curriculum review and update mechanisms to reflect industry trends and technological advancements. Setting up a structured process for curriculum review ensures that educational content remains relevant and up-to-date [3]. This can involve regular consultations with industry experts, analysis of market demands, and reviews of emerging technologies.

- Adopt project-driven teaching methods, enabling students to learn technology and theory through solving real-world problems. This approach not only makes learning more engaging and relevant but also helps students build a portfolio of practical projects that can be showcased to potential employers. Additionally, project-driven learning encourages collaboration, communication, and critical thinking, all of which are essential skills in the modern workplace.

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