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Research on the Practical Path for Cultural Digitalization to Empower Ideological and Political Courses in Vocational Undergraduate Education

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Abstract: The cultural digitalization strategy outlined in the Fifteenth Five-Year Plan continues to advance the revitalization of cultural resources and the deep integration of educational digitalization, providing both policy support and technological impetus for the advancement of ideological and political education in the new era. Vocational undergraduate education takes cultivating high-quality technical and skilled professionals who excel in both moral integrity and professional competence as its core mission, while ideological and political teaching inherently combines distinct vocational characteristics with a practical orientation. Currently, ideological and political courses in vocational undergraduate programs face several practical challenges, including insufficient distinctive cultural resources, rigid teaching models, and a lack of deep integration between cultural education and the cultivation of professional competencies. Cultural digitalization, through resource reconstruction, scenario innovation, and paradigm shift, can effectively address these shortcomings in ideological and political education within vocational undergraduate programs. Based on the national strategic context, this paper elucidates the contemporary necessity and practical value of leveraging cultural digitalization to empower ideological and political teaching, reviews the current difficulties encountered in teaching practice, and focuses on the unique characteristics of vocational undergraduate education. From five key dimensions, namely resource development, classroom innovation, industry-education collaboration, faculty training, and institutional safeguards, the paper proposes a feasible practical pathway to enhance the quality and efficiency of ideological and political education in vocational undergraduate programs, thereby achieving the educational objective of cultivating individuals through culture and forging their spirit through culture.

Keywords: cultural digitalization; vocational undergraduate education; ideological and political education; practical pathways; educational technology

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1. Introduction

Digital technologies are playing an increasingly pivotal role in the dynamic preservation of cultural resources and simultaneously catalyzing the digital transformation of education, with these two domains reinforcing each other in a synergistic, bidirectional manner. Red culture—understood as revolutionary historical narratives, spirit, and values rooted in China’s modern developmental trajectory—as well as traditional craft-based intangible cultural heritage and industry-specific cultural traditions, are undergoing systematic creative transformation through advanced digital modalities including three-dimensional digital modeling, interactive virtual simulation environments, and immersive online digital exhibition halls. These technological interventions not only enhance accessibility and authenticity but also generate novel contextual frameworks that enrich pedagogical design and deepen ideological and political education. As the national digital education strategy advances comprehensively, intelligent teaching platforms have achieved widespread integration across institutional

settings, enabling adaptive learning pathways, real-time feedback mechanisms, and multimodal content delivery. Consequently, ideological and political education is evolving beyond conventional unidirectional theoretical transmission toward more immersive, experiential, and practice-oriented paradigms grounded in authenticity and emotional resonance. Vocational undergraduate programs constitute a strategically positioned segment within the modern vocational education system, distinguished by their dual emphasis on rigorous vocational skill development and the academic depth expected at the undergraduate level [1, 2]. Their defining mission is to cultivate high-level technical and skilled professionals who embody ethical integrity, possess robust disciplinary knowledge, demonstrate applied innovation capacity, and are fully equipped to meet the multifaceted, rapidly evolving demands of advanced industrial sectors. Accordingly, it is imperative to harness the distinctive structural advantages of vocational undergraduate education to identify, develop, and implement concrete, scalable, and pedagogically sound pathways for elevating both the digital sophistication and substantive quality of ideological and political education.

2. The Contemporary Value of Cultural Digitalization in Empowering Ideological and Political Education Courses within Vocational Undergraduate Programs

Integrating cultural digitization into ideological and political education within vocational undergraduate programs constitutes a strategic pedagogical transformation that extends beyond mere technological supplementation. It reflects a systemic response to evolving national priorities in digital infrastructure development and talent cultivation, while simultaneously addressing persistent challenges such as low student engagement, abstract conceptual delivery, and the misalignment between traditional teaching formats and contemporary learning behaviors. Given the applied orientation of vocational education—emphasizing practice, industry relevance, and skill integration—digital cultural resources offer immersive, scenario-based, and interactive learning modalities that enhance cognitive anchoring and affective resonance. Furthermore, this integration aligns closely with the cognitive preferences and digital literacy profiles of today's learners, who demonstrate higher receptivity to multimodal content, real-time feedback mechanisms, and participatory knowledge construction. As a result, cultural digitization serves not only as an instructional enhancement tool but also as a structural enabler for deeper value internalization, critical reflection, and ethical reasoning within ideological and political education frameworks [3, 4].

2.1. An Inevitable Requirement for Implementing the National Cultural Digitalization Strategy

The national development framework outlines clear objectives for revitalizing diverse digital cultural resources, advancing innovative platforms for cultural education, and strengthening the convergence of digital technologies with pedagogical practices across all levels of education. Vocational undergraduate programs play a pivotal role in cultivating high-level skilled professionals who directly support the real economy and contribute to industrial transformation and upgrading. Consequently, ideological and political education within these programs must dynamically respond to broader national cultural development priorities. Integrating digital tools—such as immersive simulation, interactive multimedia archives, and AI-enhanced cultural analytics—enables the systematic revitalization of traditional craft heritage, exemplary models of craftsmanship rooted in historical continuity, and narratives of contemporary industrial progress. This integration transforms strategic policy imperatives into tangible, curriculum-embedded learning experiences. It further supports the organic embedding of advanced cultural values within vocational pedagogy, reinforcing both the ideological grounding and temporal responsiveness of ideological and political education [5]. Such alignment ensures that educational practice remains socially relevant, culturally grounded, and institutionally coherent with long-term national development goals.

2.2. The Urgent Need to Address the Practical Challenges in Ideological and Political Education within Vocational Undergraduate Programs

Traditional ideological and political education in vocational undergraduate programs encounters several persistent challenges that impede its pedagogical effectiveness. These include uneven distribution of educational resources across institutions, limited diversity in instructional methodologies, and outcomes that often remain at a surface level without fostering deep value internalization or behavioral integration. Standardized textbooks frequently lack sufficient contextualization for vocational learners, failing to bridge theoretical concepts with hands-on skill development, industry-specific ethical frameworks, and the cultivation of craftsmanship-oriented values. Moreover, conventional didactic approaches—centered on abstract theoretical exposition—do not align with the cognitive preferences of vocational undergraduate students, who demonstrate stronger engagement through applied, experiential, and practice-based learning modalities. As a result, achieving meaningful synergy between cultural literacy and professional competence remains elusive [6]. Cultural digitization offers a transformative pathway by enabling the dynamic reinterpretation and dissemination of regionally and historically significant cultural assets. It supports the design of interactive, multisensory, and scenario-based learning experiences, extends pedagogical reach beyond physical classroom boundaries, and strengthens instructional relevance, authenticity, and student motivation.

2.3. Alignment with the Educational Positioning of Vocational Undergraduate Programs

The educational attributes, vocational attributes, and undergraduate attributes constitute the three fundamental characteristics of vocational undergraduate education. From the perspective of typological positioning, vocational undergraduate education embodies a dialectical integration—simultaneously advancing the academic rigor and theoretical depth expected at the undergraduate level while grounding instruction firmly in authentic occupational contexts and industry practice [7]. Its educational objectives emphasize the cultivation of high-level technical and skilled professionals who operate effectively on the frontlines of production, construction, management, and service sectors, possessing not only robust disciplinary knowledge and applied competencies but also the capacity to analyze, adapt, and innovate when confronting complex, multidimensional real-world challenges. In the new era, the evolving demands of industrial transformation and technological advancement necessitate that skilled professionals demonstrate not only technical mastery but also cultural self-awareness, ethical judgment, and sustained professional commitment. Cultural digitalization serves as a strategic pedagogical enabler: it facilitates the systematic embedding of traditional craftsmanship values, contemporary conceptions of excellence in workmanship, and discipline-specific professional norms across curricula, teaching resources, and experiential learning environments. Through deliberate design, digital cultural assets—such as interactive heritage simulations, industry case repositories, and ethically annotated skill demonstrations—support holistic development, thereby realizing the dual imperatives of 'cultivating moral integrity through culture' and 'shaping craftsmanship through culture,' which together constitute a core dimension of vocational undergraduate educational orientation.

2.4. Adapting to the Digital Learning Characteristics of Young Students in the New Era

Contemporary vocational undergraduate students, having grown up in an era defined by pervasive digital connectivity, demonstrate distinct cognitive and behavioral learning preferences shaped by prolonged exposure to interactive media platforms, mobile applications, and immersive digital environments. They tend to engage more effectively with pedagogical approaches that emphasize visual representation, real-time feedback, scenario-based simulation, and collaborative digital tools—rather than passive reception of static textual or lecture-based content [8]. Cultural digitization strategies—including virtual study tours enabled by 3D reconstruction and spatial computing, digitally mediated performances integrating augmented reality, and adaptive scenario-based interactions grounded in authentic socio-cultural contexts—serve to concretize abstract ideological and ethical concepts. These methods foster experiential understanding by situating theoretical knowledge within relatable, dynamic, and

multisensory frameworks. As a result, student agency, intrinsic motivation, and sustained attention are significantly enhanced, contributing to deeper conceptual retention and more meaningful integration of core educational objectives within ideological and political education curricula.

3. The Practical Challenges Facing the Digital Transformation of Ideological and Political Courses in Vocational Undergraduate Education

Contemporary ideological and political education within vocational undergraduate programs encounters multiple interrelated practical constraints that impede effective digital transformation. First, the development of digital teaching resources remains highly decentralized, with limited coordination across institutions and disciplines, leading to duplication of effort and inconsistent quality standards [9, 10]. These resources often lack deep integration with industry-specific competencies, occupational standards, and real-world workplace scenarios essential for vocational learners. Second, while digital tools are increasingly adopted in classroom settings, their pedagogical implementation tends to be instrumental rather than transformative—frequently limited to presentation enhancements or basic online quizzes without meaningful redesign of learning activities or assessment strategies. Third, institutional infrastructure—including platform interoperability, data governance frameworks, and technical maintenance protocols—remains underdeveloped. Fourth, sustained policy continuity, dedicated funding streams, and cross-departmental governance structures for digital pedagogy are still nascent. Finally, many instructors face significant capacity gaps in both foundational digital literacy and advanced instructional design skills, particularly in leveraging analytics, adaptive learning systems, and immersive technologies to foster critical reflection and value internalization.

3.1. The Supply of Specialized Digital Resources Is Fragmented, and Their Vocational Relevance Is Insufficient

Currently, most publicly available digital cultural resources are primarily designed for general education and conventional higher education contexts; however, there remains a pronounced scarcity of high-quality, discipline-specific digital materials explicitly developed to support vocational undergraduate programs. These specialized resources should ideally address core pedagogical needs such as craft cultivation, curriculum innovation aligned with industry standards, and applied research supporting regional industrial upgrading. In practice, existing offerings predominantly feature broad thematic content—such as introductory overviews of red culture and traditional Chinese civilization—without sufficient granularity or contextualization for vocational disciplines including mechanical engineering, digital media arts, supply chain management, or financial services. Consequently, the content lacks strong occupational anchoring, fails to reflect real-world workplace competencies, and offers limited scaffolding for integrating ideological and political education into professional skill development. Moreover, these resources are distributed across disparate institutional platforms, government portals, and third-party educational repositories without standardized metadata, interoperable formats, or coherent taxonomies. This structural fragmentation impedes systematic adoption, hinders cross-institutional sharing, and significantly reduces reuse potential, thereby undermining sustained implementation of value-oriented education within vocational curricula.

3.2. The Integration of Digital Teaching Remains Superficial, Resulting in Relatively Weak Educational Effectiveness

Some educators inadvertently adopt a formalistic orientation toward digital teaching, placing undue emphasis on technological tools while neglecting pedagogical substance and curricular coherence. This manifests as a surface-level adoption where digital videos, interactive simulations, or online resources are deployed primarily as direct replacements for chalkboard instruction or printed handouts—without thoughtful alignment to specific learning objectives, disciplinary knowledge structures, or developmental milestones in

students' cognitive and professional growth. Consequently, the integration remains procedural rather than transformative: digital modalities fail to scaffold higher-order thinking, foster critical reflection, or support the internalization of core professional values. Moreover, insufficient attention is paid to how digital environments can be intentionally designed to reinforce ethical reasoning, cultural responsiveness, and identity formation within discipline-specific contexts. Without deliberate instructional design that foregrounds value-laden content and reflective practice, digital tools risk becoming mere delivery mechanisms rather than catalysts for meaningful learning. This limitation hinders the progression from foundational knowledge acquisition to deeper epistemic engagement, from passive reception to active construction of professional identity, and from technical proficiency to principled, socially responsible practice.

3.3. Teachers Digital Literacy in Education Is Weak, and Their Innovation Capabilities Are Insufficient

Digitalized cultural education imposes significantly higher expectations on educators' professional competencies, particularly in the critical areas of digital resource evaluation, pedagogically sound scenario construction, and value-oriented instructional assessment. A notable proportion of ideological and political education instructors face challenges in adapting to this evolving landscape: many hold outdated conceptions of digital pedagogy, possess only rudimentary operational competence with mainstream educational platforms and intelligent teaching aids—such as interactive whiteboards, learning management systems, and AI-assisted assessment tools—and lack systematic training in repurposing open digital content for curriculum-aligned, context-sensitive instruction. Furthermore, immersive classroom design—encompassing virtual reality simulations, gamified learning modules, and multimodal narrative integration—remains underdeveloped due to insufficient methodological guidance and scaffolded practice opportunities. Institutional support structures for digital upskilling are often fragmented, inconsistently implemented across departments, and inadequately aligned with national educational modernization goals, resulting in a persistent gap between infrastructure deployment and pedagogical application, which ultimately constrains the scalability and sustainability of teaching innovation.

3.4. The Support Mechanisms for Digital Education Remain Inadequate, Lacking Long-Term Institutional Backing

Most vocational undergraduate institutions currently face structural constraints in supporting digital ideological and political education, including the absence of specialized digital resource repositories tailored to curriculum requirements and insufficient deployment of immersive teaching infrastructure such as VR-enabled classrooms, interactive simulation platforms, and AI-assisted pedagogical tools. Moreover, collaborative frameworks for co-developing and interoperably sharing digital educational assets between higher education institutions and industry partners remain underdeveloped, resulting in fragmented resource pools and duplicated efforts. Industrial cultural elements—such as exemplary craftsmanship narratives, enterprise innovation case studies, and sector-specific ethical paradigms—are not systematically embedded into course design, delivery, or assessment practices. Concurrently, governance mechanisms—including monitoring protocols, quality assurance benchmarks, and incentive structures—are insufficiently aligned with digital pedagogical advancement. Digital education outcomes are rarely factored into faculty performance evaluations, promotion criteria, or institutional accountability metrics, thereby dampening teacher engagement in pedagogical innovation. Without integrated policy support, sustained investment, and cross-sectoral coordination, building a resilient, scalable, and pedagogically coherent digital ideological and political education ecosystem remains a significant challenge [11].

4. The Core Practical Pathway for Cultural Digitalization to Empower Ideological and Political Education Courses in Vocational Undergraduate Programs

To effectively address the multifaceted challenges confronting ideological and political education in vocational undergraduate programs, this study systematically aligns the national cultural digitalization strategy—articulated within the framework of the 15th Five-Year Plan—with the pedagogical priorities and occupational orientation inherent to vocational higher education [12, 13]. Guided by a rigorous problem-oriented methodology, it constructs a comprehensive, sustainable educational pathway structured across five interdependent dimensions: first, the systematic development of high-quality, value-aligned digital cultural resources tailored to students' cognitive levels and professional contexts; second, the innovation of classroom teaching models through immersive technologies such as virtual reality and interactive multimedia to enhance ideological engagement; third, the deepening of industry–education collaboration to co-create authentic, practice-integrated cultural learning scenarios; fourth, the targeted empowerment of faculty through specialized training in digital pedagogy and ideological discourse competence; and fifth, the establishment of robust institutional safeguards—including policy frameworks, quality assurance mechanisms, and cross-departmental coordination systems—to ensure long-term implementation fidelity and continuous improvement.

4.1. Focus on School-Specific Adaptation to Establish a Professional Digital Ideological and Political Education Resource Database

High-quality and appropriately tailored educational resources constitute the foundational support for digital ideological and political education in vocational undergraduate institutions. These institutions must align resource development closely with their distinctive institutional positioning, disciplinary strengths, and talent cultivation objectives. Rather than adopting generic or off-the-shelf digital content, they should systematically curate and integrate authoritative, officially endorsed digital cultural materials—including red cultural resources, traditional craftsmanship knowledge, intangible cultural heritage documentation, and exemplary professional practice cases—to construct a school-specific, discipline-integrated digital ideological and political education resource database. This curation process requires rigorous pedagogical mapping: engineering disciplines may emphasize precision manufacturing narratives, technical ethics frameworks, and innovation-driven labor stories; arts-related programs may foreground aesthetic traditions embedded in intangible cultural heritage, creative reinterpretation of folk art forms, and ethical dimensions of artistic practice; while economics and management programs may highlight integrity-based governance models, responsible business conduct, and case-based explorations of professional accountability. Such targeted adaptation fosters a coherent 'one discipline, one distinctive feature' resource architecture. Furthermore, a robust governance mechanism—jointly operated by the School of Marxism, academic departments, and domain practitioners—is essential to ensure continuous review, timely updating, and iterative refinement of all resources. This collaborative oversight guarantees political soundness, disciplinary accuracy, pedagogical relevance, and contextual appropriateness, thereby mitigating systemic challenges such as resource fragmentation, conceptual vagueness, and insufficient alignment with vocational education goals.

4.2. Focusing on Classroom Innovation to Establish a Deep Digital Teaching Paradigm

To overcome the persistent challenge of formalism in digital teaching—where technology is deployed superficially without meaningful pedagogical transformation—the core objective must be the deep, purposeful integration of digital tools with value-oriented educational goals. This integration requires careful alignment with the cognitive development patterns, prior knowledge structures, and experiential learning preferences characteristic of vocational undergraduate students. The resulting pedagogical framework operates as a coherent, iterative closed-loop model structured around four interdependent phases: first, introduction via digitally enriched, contextually grounded scenarios that activate prior knowledge and establish relevance; second, case-based critical inquiry that fosters analytical thinking, ethical reasoning, and collaborative

problem-solving; third, deliberate elevation of professional values—including integrity, responsibility, and social contribution—through guided reflection and discourse; and fourth, consolidation through authentic, role-aligned practical application that bridges theory and workplace practice. Immersive modalities such as VR-enabled virtual study tours, interactive digital scenario enactments, and curated documentary narratives featuring skilled practitioners serve to deepen affective engagement and contextualize abstract concepts. Thematic exploration centered on cultural confidence, the spirit of craftsmanship, and service-oriented professional identity is facilitated through carefully sequenced digital case studies that invite comparative analysis, historical contextualization, and contemporary reinterpretation. Furthermore, the translation of traditional artisanal virtues—such as precision, perseverance, and reverence for quality—into domain-specific professional ethics supports the internalization of cultural cognition as actionable competence. Smart learning platforms enable dynamic, adaptive task design—including real-time feedback loops, collaborative annotation, and multimodal response formats—that extend instructional time beyond the physical classroom and enrich formative assessment. Emerging infrastructures like the Education Metaverse offer new possibilities for co-constructing knowledge within persistent, scalable virtual learning environments where spatial presence, role embodiment, and synchronous interaction enhance pedagogical fidelity. Concurrently, digitization initiatives targeting regional intangible cultural heritage and time-honored craft traditions support their preservation, accessibility, and pedagogical repurposing for contemporary curricular needs [14].

4.3. Focusing on Industry–Education Integration to Establish a School-Enterprise Collaborative Digital Education System

The integration of industry and education constitutes a foundational principle of vocational undergraduate education and serves as a defining characteristic of digital cultural education initiatives. Higher education institutions must move beyond traditional, campus-centric pedagogical models and actively foster deep, structured collaboration with enterprises, industrial parks, intangible cultural heritage preservation centers, and red cultural education bases. Such partnerships enable the co-development and shared utilization of high-quality digital educational resources—such as documented narratives of exemplary practitioners, in-depth analyses of skilled professionals’ work processes, digitized representations of sector-specific cultural traditions, and curated materials illustrating professional ethics and occupational values. This resource aggregation helps harmonize academic learning environments with authentic industrial contexts, thereby reinforcing the relevance and applicability of curricular content. To further enhance experiential learning, institutions should design and implement innovative digital pedagogical approaches—including live-streamed expert-led seminars, immersive virtual industry field visits, and interactive vocational culture promotion activities. These initiatives can be systematically incorporated into the ideological and political education framework through credit-bearing modules. Additionally, students are encouraged to apply their disciplinary competencies in practice-oriented projects—for instance, developing multimedia interpretations of traditional cultural elements or producing digital storytelling profiles highlighting skilled professionals’ contributions—thus cultivating professional identity, ethical responsibility, and integrative competence. Through sustained alignment among cultural literacy, professional development, and industrial engagement, institutions ensure coherent educational outcomes and robust talent cultivation pathways.

4.4. Focusing on Faculty Empowerment to Cultivate a Professional Digital Ideological and Political Education Teaching Team

The digital pedagogical competence of teachers constitutes a foundational determinant of instructional quality and student learning outcomes in digitally enhanced higher education environments [15]. To systematically strengthen this capacity, institutions should institutionalize a sustained, tiered faculty development framework

that integrates both theoretical grounding and practice-oriented skill building. This framework must include targeted training modules on evidence-informed digital resource evaluation, learner-centered digital instructional design principles, the intentional integration of immersive technologies—such as virtual reality and interactive simulations—to deepen conceptual understanding, and proactive identification and mitigation of pedagogical risks associated with algorithmic bias, data privacy, and cognitive overload in digital learning contexts. Concurrently, dedicated internal teaching-research platforms should be operationalized to host recurring digital open lectures, peer-led teaching seminars grounded in classroom-based inquiry, and collaborative case study development cycles. These activities collectively nurture a culture of reflective practice and collective knowledge advancement. Furthermore, cross-disciplinary digital ideological and political education innovation teams—comprising experienced educators, curriculum designers, and educational technologists—should be formally constituted to conduct applied research, co-develop scalable pedagogical models, refine contextually responsive digital teaching cases, and advance holistic teacher capability across three interdependent domains: adaptive digital resource transformation, innovative classroom enactment, and principled value-integrated instruction.

4.5. Focusing on Institutional Safeguards to Build a Long-Term Digital Educational Ecosystem

A comprehensive safeguard system is pivotal to ensuring the long-term effective implementation of digital ideological and political education. Higher education institutions must adopt a holistic, integrated approach that coordinates hardware infrastructure, institutional frameworks, pedagogical governance, and dynamic evaluation mechanisms to solidify the foundation of educational practice [16]. This entails sustained investment in next-generation smart classrooms equipped with interactive AI-assisted tools, immersive virtual simulation environments for experiential learning, and secure, scalable digital ideological and political education platforms compliant with national data security standards. Concurrently, institutions should develop and promulgate detailed operational guidelines for digital teaching delivery, establish rigorous, multi-tiered resource review protocols grounded in educational quality assurance principles, and formalize university-enterprise collaborative education mechanisms—such as joint curriculum design, shared digital resource repositories, and industry-validated competency assessments—to standardize expectations and elevate pedagogical rigor. The evaluation system must be systematically reformed to incorporate measurable indicators including digital pedagogical innovation, cultural literacy outcomes, student-centered learning achievements, and tangible outputs from cross-sectoral partnerships, all embedded within faculty performance appraisal and incentive structures. Moreover, a robust, cyclical teaching supervision mechanism—featuring peer review, student feedback analytics, and periodic quality audits—should be institutionalized to proactively identify and rectify superficial or ritualistic practices, thereby cultivating a standardized, evidence-informed, and sustainably evolving digital education ecosystem.

5. Conclusion

The cultural digitalization strategy enhances ideological and political education in vocational undergraduate programs by aligning digital infrastructure with career-oriented goals. Despite current gaps—such as incoherent resources, superficial tool use, and fragmented faculty training—institutions can revitalize their mandate through a five-dimensional framework: 1) curating high-fidelity digital cultural resources; 2) innovating active, digital-led pedagogy; 3) integrating industry partnerships for authentic learning; 4) building faculty digital capacity; and 5) implementing adaptive governance. This integrated approach fosters craftsmanship, cultural awareness, and professional accountability, ultimately preparing a socially responsible and technically proficient workforce.

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