

From Cognitive Progression to Competency Integration: Digital Innovation for Integrated Value Based Education - A Case Study of Digitally Driven Innovation in the Shanghai - Wanzhou Education Collaboration

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Abstract: This paper employs 'Unity of Knowledge and Action' as our basic theoretical framework, from which we draw on the experience of implementing 'Red + Digital Intelligence' educational assistance by the 'Volunteer Teaching with Compassion, Shanghai - Wanzhou Bond' practice team in Wanzhou, aiming at analyzing the framework's advantages and significance. The model upgrades the red resources into the main chain of ideological and political teaching activities, such as immersive games for primary school students, situational debates for secondary school students and theoretical refinement for university students. The framework achieves tiered integration of Digital Intelligence competency (AI + Art Programming + Engineering). It realizes value internalization with an 'empathy, co-action, and co-creation' action loop, as well as competency integration through a growth passport certification mechanism. It forms the Three-Dimensional Spiral Collaborative Mechanism among universities, primary or secondary schools, and governments, which breaks through the constraints of traditional unilateral practices to the greatest extent. This mechanism gives enlightenment about the dilemma of cognitive disconnection and resource fragmentation in the integration of ideological and political education at different levels of education.

Keywords: Unity of Knowledge and Action; Integrated Ideological and Political Education; Dual Integration

1. Introduction

The 'Unity of Knowledge and Action', a quintessential concept in traditional Chinese educational thought, emphasizes the spiral progression of 'Cognition - Practice - Re-Cognition' and the dialectical unity of cognition and practice. This concept aligns with the core principle of 'Progressive and Spiral Advancement' in integrating ideological and political education across primary, secondary, and tertiary levels. University social practice serves as a critical bridge between ideological and political education in the classroom and societal engagement, has been redefined under the dual impetus of 'Red Spirit Infusion' and 'Digital Intelligence Empowerment'. It not only facilitates the self-growth of university students but also promotes competency development among primary and secondary school students, while exploring chain reactions in ideological and political education across stages. The 2025 'Volunteer Teaching with Compassion, Shanghai - Wanzhou Bond' assistance program [1] innovatively adopted a 'Red Spirit Infusion' and 'Digital Intelligence Empowerment' model, which not only supports rural revitalization but also activates dual growth momentum for both university students and rural students within an interactive framework of the Unity of Knowledge and Action. This practice provides a paradigmatic case for studying integrated ideological and political education.

2. The Generative Logic and Connotation of the Unity of Knowledge and Action about the ‘Red + Digital Intelligence’ Model

2.1 Resonance Between History and Reality: The Deep Roots of Shanghai - Wanzhou Collaboration

After the Shanghai - Wanzhou pair-assistance on the Three Gorges Reservoir Area was initiated by the CPC Central Committee since 1992 [2], the two cities have been cooperating for more than three decades. As the core relocation area of the Three Gorges migration project, Wanzhou embodies the migrant spirit of ‘sacrificing the small family for the greater good’, which has become a vivid educational resource for red ideological education. The collective experience from visiting the Three Gorges Resettlement Memorial Hall, the immigration handprint area, rebuilt ancestral houses, etc., is essentially our national selfless spirit represented by dedication. This historical context provides both the emotional foundation and core values for red ideological formation, elevating university students’ support activities beyond short-term volunteer service to a profound internalization of national and communal consciousness.

2.2 Reconstructing Integrated Ideological and Political Education in the ‘Red + Digital Intelligence’ Model

In view of further enhancement of the comprehensive ideological and political education effect, we employed a twofold approach to achieve educational resources integration for the practice team.

2.2.1 Transformation of Red Resources into Teaching Chains

The practice group turned the local red resources, such as the Wanzhou Migratory Spirit, into an ideological and political teaching case system for the three levels, considering the cognitive characteristics of students at different educational stages.

At primary school grade level, students learn ‘dedication’ values with the help of play and tangible objects such as using handprint and assembling ancestral house models in immersive game designs.

At the middle school stage, readings of migrant family letters in class, as well as comparisons between the old and new homes, were used as context to provoke personal reflections based on the students’ existing values, helping them build a deepened sense of national identity through reflective analysis.

Universities: Train students as museum docents so they can improve their interpretation skills through using historical materials about a person, organization, event, or topic and then interacting with the material they are presenting to a knowledgeable audience. At the university level, students serve as docents in the hall of memorials, refining their theoretical interpretive abilities using historic materials, and thereby creating knowledge-action nexus.

This layer-by-layer and staged design can transform local red resources into a carrier for ideological and political education from the early childhood stage to adulthood. [3].

2.2.2 Cross-Stage Integration of Digital Intelligence Competencies

An ‘AI + art programming engineering’ tiered activity chain has been established.

In primary schools, the ‘The Flying Computer’ drawing activity was introduced to students with the hope of piquing their interest in technology by using imagination to link intangible ideas to real-life knowledge and concepts.

At the intermediate school stage, through a deciphering game of a binary code, the development of students’ logical thinking and transition from figurative to abstract cognition can be cultivated.[4].

At the high school stage, an intelligent hardware disassembly and reassembly project was applied to improve the research of technical principles among high school students.

The purpose of the university level is designing embodied teaching methods to benefit basic education and learning.

This design solves the problems of ‘repeated enlightenment and fragmented cultivation’ to varying extents on different levels of education by combining competency objectives with 3D contents, progressive instructional carriers, and competency integration, to foster a passion for learning by stimulating students’ interest in STEM subjects.

3. Pathways to Achieving Dual Educational Functions in the Context of Integrated Ideological and Political Education

Utilizing the value-shaping and capacity-cultivation powers, the practice team transforms ideology-and-politics education among primary school students into school-based lessons. Then they advance it to key school student classrooms and eventually take it to college platforms through the principle of emotions first—making use of behavior-conducive abilities to gain appropriate competencies.[5]

3.1 Value Internalization: Constructing an ‘Empathy - Coaction - Co-Creation’ Action Loop

The practice team broke away from the traditional one-way indoctrination model and established a three-level action chain to realize a spiral progression of value internalization.

By organizing primary and secondary school students to conduct interviews with migrant elders and document their narratives, such intergenerational dialogue served to awaken collective memory. Meanwhile, university students collaboratively reconstructed the migration route of the three gorges migrants, cultivating a sense of mission rooted in ‘sacrificing the self for the nation’.

Through the joint creation of the digital picture book *Shanghai - Wanzhou One Heart*, historical artifacts such as migrant handprints and ancestral house images were transformed into animated narrative carriers, turning red spirit into tangible and perceptible symbolic memory.

When children exclaimed, ‘Design faster programs’, it signifies that the migrant spirit had undergone a threefold forging of emotional immersion (empathy), action-based refinement (co-action), and value reconstruction (co-creation). The abstract national spirit was transformed into tangible, experiential local memory, marking a paradigmatic shift in which red heritage evolved from historical remembrance to conscious innovation.

3.2 Competency Integration: From Knowledge Transmission to Competency Transcendence Resolving Difficulties in Competency Development with a Dual Track Strategy

3.2.1 Tiered Embodied Learning to Overcome Cognitive Barriers

Development of a Progressive Cognitive Chain for the Interpretation of Artistic Inspiration Physically Deciphered and its Main Applications was established.

Through the art activity ‘The Flying Computer’, primary school students can invigorate their imagination and have a concrete perception of the charm of technologies with colours and lines (Art Driven).

Middle school students use their bodies to work out the ‘Walking Commands’ programming game using physical decipherment and translate data flow logic.

High School students undertake carry out smart hardware disassembly and assembly practice, explore the basic working principle of technology based on screwdriver and circuit board (principal exploration).

This ‘AI + Art Programming Engineering’ turns the abstract computer science into concrete, tangible and perceptible immersive game, which can reduce the rural children’s perception of technological isolation.

3.2.2 Growth Passport Certification System Building a Certification Community for Integrated Competency Development

The practice team creatively designed a four-tiered competency certification system.

At the primary school level, students earn the ‘Technology Exploration Badge’ through the ‘Future Technology Drawing’ activity, completing their initiation into concrete cognition.

At the middle school level, they win the ‘Logic Challenge Badge’ by deciphering binary codes, facilitating the transition to abstract thinking.

At the high school stage, students unlock the ‘Engineering Practice Badge’ through hardware modification projects, achieving the application of technical principles.

At the university level, students receive the ‘Educational Transformation Badge’ by designing cross-stage lesson plans, promoting iterative knowledge that will benefit the foundational education.[6]

4. The Interconstructive Mechanism and Contemporary Significance of Dual Educational Functions

4.1 Collaborative Growth of Educators and Learners

In the education support practice driven by the dual tracks of *Red Culture* and *Digital Intelligence*, the value of talent cultivation manifests a distinct two-way empowerment dynamic. For the primary and secondary school students as recipients, the activities effectively promoted the awakening of patriotic sentiment and the inheritance of migrant spirit, while also enhancing their digital intelligence and competency development. For university student instructors, the practice deepened their dedication and sense of social responsibility, while also advancing professional skills and carrying forward red heritage.

This collaborative advancement between educators and learners in value guidance and skill development vividly exemplifies the dual educational logic of social practice: the mutual construction of knowledge and action, and the reciprocal enhancement of teaching and learning [7].

4.2 Constructing a Three-Dimensional Spiral Ideological Political Collaboration Network among Universities, Schools and Government

The practice team, leveraging a multi-stakeholder collaborative mechanism, innovatively restructured the ideological and political education ecosystem [8]:

Universities utilized their theoretical strengths to provide curriculum standards and teacher training for ideological education in primary and secondary schools, primary and secondary schools provided feedback on the effectiveness of ideological education curricula, while local governments injected institutional momentum through policy support and platform development, forming a mechanism of ‘university theoretical output → school practical validation → government institutional consolidation.’

This three-dimensional spiral structure transcends the unidimensional constraints of conventional social practice [9], enabling ideological and political education to achieve resource integration and shared responsibility within a multidimensional educational ecosystem.

4.3 Paradigm Innovation in University Social Service Function

The practice team transcends the traditional unidirectional knowledge transmission model of volunteer teaching by establishing an integrated action framework combining red heritage preservation, technology-enabled empowerment, and collaborative talent cultivation. This advancement embodies a new era for the “action-oriented, unity of knowledge and practice” philosophy. In this process, universities have evolved from being mere ‘resource providers’ to becoming ‘co-creators of value’, injecting intrinsic momentum into the integration of ideological

and political education across primary, secondary, and tertiary levels, while pioneering new theoretical and practical frameworks for the new era.

5. Conclusion: Towards a New Era of Bidirectional Empowerment through the Unity of Knowledge and Action

The ‘Red + Digital Intelligence’ educational assistance practice of Shanghai University of Technology takes the unity of knowledge and action as its methodological foundation and dual-function education as its core value, the initiative establishes an innovative paradigm for university social practice and explores a path toward integrated ideological and political education across primary, middle/high, and tertiary levels. It demonstrates that social practice serves not only as a crucible for moral cultivation—where red resources forge the faith of young people—but also as a bridge for empowerment, activating the future of rural communities through digital and intelligent technologies. Moreover, it is a space of mutual construction, where university and middle/primary school students grow together through the exchange of knowledge.

As Tao Xingzhi noted, ‘Action is the beginning of knowledge; knowledge is the completion of action.’ [10] When ideological and political education across universities, middle and primary schools are linked into a cohesive chain under the framework of the unity of knowledge and action, and when red revolutionary heritage and digital intelligence intertwine and co-evolve through intergenerational transmission, education begins to weave an integrated narrative through the mutual construction of knowing and action.

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