Digital Integration of Red Music Resources into Teaching Application Path and Practical Reflection

Liping Qiu, Hong Liu

Ji 'an College, Jinggangshan Red Culture Inheritance and Development Research Center, Ji'an, Jiangxi, China

Abstract. As an important carrier of China's revolutionary history and cultural spirit, red music embodies profound patriotism, collectivism, and revolutionary ideals. With the development of digital technology, the preservation, dissemination, and educational application of red music resources have ushered in new opportunities. Integrating digital red music resources into classroom teaching, through the subtle educational approach of "Ruhua" can enable students to achieve ideological elevation through emotional resonance and value recognition. This paper explores how to effectively leverage the educational function of red music resources from four aspects: the connotation of digital red music resources, the value of classroom Ruhua education, specific application paths, and reflections on teaching practices.

Keywords: Red Music Resources; Digitalization Teaching Application; Practical Reflection.

1. Introduction

Red music was born from the great practices of China's revolution, construction, and reform, possessing distinct characteristics of the era and educational value. It is not only a witness to history but also a carrier of spiritual heritage. In the digital age, transforming it into digital resources for educational use maximizes its educational impact. The core of digital humanities research lies in "digitizing research objects cto support, ensure, and innovate the content, methods, and models of humanities research. These research objects include various computable basic data objects, such as free text, formatted data, images, and sounds."[1] Computational tasks involving these data include author attribution and style analysis, emotional analysis of works, mining of character relationships, pattern discovery and visualization, and ontology construction in the humanities fieldforming a series of text analysis and retrieval, map visualization, and audio-video retrieval applications. Through digital means such as AI technology and virtual reality, red music can be restored, preserved, and recreated, reviving its vitality and providing high-quality resources for ideological and political education, aesthetic education, and patriotic education.

Case studies on the digital transformation of red cultural resources primarily focus on local practices. Research works such as Wang Jing's "Digital Transformation of Guangzhou's Red Culture in the Era of Convergent Media", Huang Wei's "Innovative Service Models for Red Cultural Information Resources in Digital Transformation", and Zhang Yi's "Empowering Gansu's Red Cultural Resources through Digital Technology" are based on database development in Guangzhou, Shanghai, and Gansu. These studies promote the integration of red culture and education while accelerating digital empowerment in education. Scholars also highlight that in the digital age, the inheritance of red cultural genes faces risks from information and cognitive challenges. Cao Yuxuan proposes in "The Value, Challenges, and Practical Paths of Red Cultural Gene Inheritance Education in the Digital Age" that digital empowerment should be prioritized, institutional foundations strengthened, and a digital governance system for red cultural education established. However, there are only two theoretical studies on the digital inheritance and development of red music resources: Yang Juan's comprehensive digital preservation strategy for Dabie Mountain's red music culture, and Zha Jianmin's integration of digital teaching resources with ideological education, campus culture, and media dissemination to advance music education. Given this context, theoretical and practical research on red music digitalization remains underdeveloped, indicating significant research potential. To this end, this paper explores the application pathways of integrating digital red music resources

into teaching through the educational philosophy of "Ruhua". By incorporating red music culture into university classrooms, we can leverage its moral education role that subtly influences and inspires students. This approach helps cultivate college students' correct worldviews, outlooks on life, and values through a gentle, imperceptible influence.

2. The Connotation and Characteristics of Digital Red Music Resources

Red music resources refer to musical works and related cultural carriers formed during the revolution, construction, and other endeavors under the leadership of the Communist Party of China, reflecting the themes of the times and embodying the national spirit. Red music is imbued with red memories, representing the fine qualities of Chinese Communists. It is not only an important component of the value system of the Chinese people but also a social spiritual driving force that unites national strength and social consensus. Its types mainly include: revolutionary historical songs (such as "The March of the Volunteers" and "The Yellow River Cantata"), red film and television soundtracks (such as the theme songs of "Tunnel Warfare" and "The Shining Red Star"), new era main melody works (such as "Me and My Motherland" and "Stay True to Our Original Aspiration"), as well as auxiliary materials related to these works, such as creative backgrounds, historical stories, musical scores, and performance videos. These resources are not only the crystallization of musical art but also vivid historical textbooks and spiritual torches. The digitization of red music resources refers to the process of collecting, processing, storing, disseminating, and applying traditional red music resources through information technology.

The digitization of red music resources involves three key dimensions: First, digitizing physical assets. This entails converting physical materials like sheet music, records, vintage photographs, and instruments into digital formats through technologies such as audio encoding, high-definition scanning, and 3D modeling, while establishing standardized databases. Second, creating interactive digital experiences. By leveraging VR, AR, and AI technologies, immersive environments like virtual concert halls and historical reenactments are developed. Third, building networked distribution channels. Through online platforms, mobile apps, and social media, a comprehensive sharing system is created to transcend time and space constraints. Compared to traditional resources, digital red music resources exhibit three distinctive features.

(1)Audience audiovisual intuitiveness

Through audiovisual and animation formats, abstract musical emotions are transformed into tangible experiences, lowering the learning threshold for students. For instance, Yancheng Normal University employs AI audio restoration technology to clean historical recordings. By utilizing melody completion algorithms that analyze folk song modes and rhythmic patterns, they have restored incomplete works like "Yanfu Children's Corps Song" and established a structured red music database alongside an intelligent retrieval knowledge graph. Students can access platforms like QQ Music to generate "Listen to Learn History" QR codes, with individual tracks reportedly surpassing 50,000 plays. The red music knowledge graph deepens students' understanding of song structures while expanding their comprehension of the creative background of such songs.

(2)Learning group initiative

Students can engage with digital resources through interactive methods like clicking, dragging, and creative activities, shifting from passive reception to active exploration. Integrating red-themed music digital resources into classroom teaching transforms the traditional one-way indoctrination model of ideological education, enhancing experiential learning and interactivity. The Music College of Dezhou University promotes a "Four-Step" classroom model: "Appreciation + Discussion + Creation + Practice". During the "Appreciation" phase, students are guided to evaluate red-themed musical works. In the "Discussion" phase, in-depth explorations are organized. The "Creation" phase encourages student-generated compositions. The "Practice" phase involves organizing

performances and social activities. At Li Gongpu Primary School, the music teaching team explores deep AI integration in primary education. They utilize AI-generated music platforms to create stage-appropriate accompaniments for different grade levels, employ AI-assisted software for music theory composition, and apply AI audio analysis tools for real-time vocal evaluation and personalized guidance. Meanwhile, Teacher Fu Yeling from Hainan Lingshui Tianzi Central Primary School has introduced the "Dual-Teacher Classroom" model from the National Smart Education Platform to rural schools. Through interactive smart teaching and role-playing activities, they transform dry music knowledge into lively and accessible content.

(3)Interdisciplinary resource integration

The integration of knowledge from history, Chinese language, fine arts, and other disciplines creates interdisciplinary synergies that enhance educational coherence and depth. Interdisciplinary collaboration: Yancheng Normal University has formed a cross-disciplinary research team comprising "ideological education instructors, music scholars, and AI engineers" who work in tandem to advance initiatives. University-local partnership: Universities collaborate with local revolutionary heritage sites through deep collaboration mechanisms. For instance, they jointly developed an "AI Music Guide" with the New Fourth Army Memorial Hall, training dialect speech synthesis models to narrate creative stories. The memorial also deployed intelligent arrangement terminals to generate personalized commemorative red-themed melodies. Faculty development and institutional support: Conducted "AI+Red Music Ideological Education" training programs covering technology, cultural literacy, and pedagogy. Established digital resource standards, launched specialized research projects, and incorporated student creative works into the credit system.

3. The Educational Value of "Ruhua" of Red Music Resources in the Classroom

Anthropologist Benedict posited: "Every society cultivates an ideal adult character, striving to shape such an ideal personality through cultural dimmersion." [2] This suggests that as societies evolve, dominant cultural concepts are formed through biological predispositions, cultural immersion, socialization, and emotional influences. Specifically, the 21st century marks the flourishing and widespread application of digital humanities. Millennia of civilization have accumulated rich knowledge for humanity. The integration of red music culture with digital humanities represents the preservation, organization, retrieval, utilization, and reuse of knowledge. Through this fusion, digital transformation facilitates humanistic evolution, serving as a form of \ "enculturation\" (the process of cultural assimilation) that subtly shapes individuals. In educational contexts, enculturation emphasizes non-coercive, emotionally engaging methods to help students internalize knowledge and values, embodying the principle of "silent nourishment." College students are at a critical stage of character formation. By incorporating digital red cultural resources into both classroom and extracurricular activities, schools play a vital role in this enculturation process. Specifically, school education constitutes a special arrangement and form of enculturation, serving as a purposeful component of the entire educational system. Through this process, students gradually internalize the spirit of red culture—its perseverance, patriotism, and progressive values—thereby perpetuating its spiritual essence. Through its melodic charm, lyrical depth, and narrative power, red music resonates with students' emotions, sparking reflections on revolutionary ideals and cultural heritage, ultimately fostering natural value recognition. The digital transformation of red music enhances classroom immersion in three key aspects.

(1)Strengthen students' patriotic resonance

Digital resources can be effectively utilized through the combination of "music + historical imagery" and "music + storytelling". For instance, when teaching "The Yellow River Cantata", educators can incorporate authentic footage from the Anti-Japanese War era. This includes

scenes of Eighth Route Army soldiers fighting fiercely on the Loess Plateau, civilians risking their lives to support frontline troops, and the haunting ruins left by Japanese invaders. By juxtaposing stirring melodies with these stark historical visuals, students can vividly grasp the urgency of "defending the Yellow River" and the profound sense of national duty, thereby awakening patriotic sentiments. Additionally, incorporating firsthand accounts from wartime witnesses—such as veterans recalling their desperate battles along the Yellow River banks or ordinary citizens using songs to convey beliefs and boost morale—enhances the experience. Through the seamless integration of audio and visual elements, abstract historical narratives become tangible, allowing students to deeply comprehend the indomitable national spirit and profound patriotic sentiment embedded in "The Yellow River Cantata" through immersive learning.

(2)Re-creation promotes internalization of value

Interactive digital platforms empower students to reinterpret revolutionary music through AI-powered arrangements of "Singing to the Motherland". By adapting the anthem, learners delve into its lyrical essence, transforming patriotic ideals from abstract slogans into personal emotional expressions. Students upload melodic fragments, with AI tools automatically generating chord progressions and rhythms based on input preferences (e.g., classical, pop, electronic), while preserving the iconic melody of "Five-Star Red Flag fluttering in the wind, the triumphant song resounds loud and clear". When adjusting timbre, students can choose orchestral grandeur, piano clarity, or traditional instrument resonance, each selection imbuing the anthem with distinct emotional warmth. The erhu's lyrical notes evoke the majestic flow of the Yellow River, while electronic drumbeats mirror the spirited strides of modern youth. The platform's lyric analysis module reveals historical footage and context when users click "Five-Star Red Flag", allowing students to feel the era's pulse through fingertip interactions. After completing their versions, students share their adaptations in the community, where peers experiment with diverse instruments. For instance, a child choir with synthesizer effects breathes youthful vitality into "Singing to the Motherland". This creative process transcends mere imitation, blending algorithmic innovation with humanistic spirit to transform textbook patriotic ideals into personal musical narratives. Through melodies, every participant discovers their own red memories and emotional values.

(3) Diversified works enhance cultural identity

The digital resource library contains red music works from multiple ethnic groups and periods, such as the Xinjiang folk song "We Xinjiang Good Place," whose cheerful melody blends the melodious tones of the traditional Uyghur instrument reba, while the lyrics depict the magnificent landscapes of both sides of the Tianshan Mountains and the happy lives of people from various ethnic groups. The Tibetan song "The Singing of the Emancipated Serfs" showcases the joy and gratitude of serfs gaining liberation and a new life after the democratic reform in Xizang, with its heartfelt singing and accompaniment by the zanqin. These works, spanning different regions and ethnicities, collectively bear the revolutionary history and construction achievements under the leadership of the Communist Party of China. They help students recognize the unity in diversity of red culture while listening to songs in different ethnic languages and experiencing various musical styles, deeply understanding the historical process of all ethnic groups striving together and prospering under the Party's leadership, thereby enhancing their sense of identity and belonging to the Chinese nation.

4. Practical Paths for Integrating Digital Red Music Resources into the Classroom

(1)Build a digital resource platform to promote the integration of cross-disciplinary resources

The core of building a digital resource platform for Red-themed music and achieving interdisciplinary integration lies in creating an ecosystem that combines digitization, intelligence, and interactivity. Key strategies include: preserving and restoring Red-themed music resources through digital technologies; deepening content exploration and user experience via knowledge graphs and AI; innovating teaching and practice models with interdisciplinary approaches; and ensuring platform sustainability through collaborative sharing mechanisms. Comprehensive collection of scattered Red-themed music resources across regions is essential, including sheet music, vintage records, audio tapes, video materials, original manuscripts, and oral histories. For aging or poorly preserved materials, AI-powered audio restoration techniques can eliminate noise from historical recordings, while melodic reconstruction algorithms may be employed to repair incomplete works. Building on this foundation, establishing a Red-themed music gene bank or knowledge graph through multi-dimensional categorization (music themes, creation periods, historical events, spiritual connotations) will lay the groundwork for future in-depth research and intelligent retrieval.

tiBuilding Interdisciplinary Immersion Scenarios. The digital application of red music resources should transcend traditional music classrooms, requiring deep integration with multidisciplinary teaching to form a "Music+" immersive ecosystem. Moreover, red music inherently embodies multiple attributes including history, politics, literature, and art, serving as a natural medium for interdisciplinary integration. For instance: Music and History Integration. In the "Anti-Japanese War" unit of history classes, VR technology recreates the 1942 premiere of "Defend the Yellow River," allowing students to "participate" in performances through virtual avatars, experiencing the revolutionary fervor of "the wind roaring, horses neighing" while understanding music's role in rallying resistance forces. Another example: Music and Chinese Language Synergy. In "Poetry Appreciation" classes, students compare the rhythmic patterns of the poem "Seven-Character Verse: The Long March" with the melody of the song "The Long March Suite," using digital platforms to display revisions in lyric manuscripts, thereby appreciating the symbiotic relationship between literature and music. Additionally, Music and Ideological Education. In "Ideals and Beliefs" courses, AI-powered sentiment analysis tools enable students to listen to different versions of "The Internationale" (e.g., French original, Chinese cover), analyzing the historical context behind melodic changes and exploring the evolution of "communist ideals" across different historical periods.

(2)Innovative teaching mode, enhance the appeal of education

Creating immersive educational environments. By leveraging virtual reality (VR) and augmented reality (AR) technologies, we can transcend spatial and temporal constraints to craft highly realistic historical scenarios for students. For instance, iconic scenes like the "Red Boat on South Lake" or "Yan'an Cave Dwellings" can be recreated, accompanied by synchronized playback or live performances of revolutionary music to create audio-visual immersive experiences. Practical applications demonstrate that motion capture technology enables students to virtually "enter" historical settings—such as reenacting the scene of Anti-Japanese United Army soldiers singing military songs in secret camps. This intense sense of presence significantly enhances understanding of historical events and their spiritual significance. Furthermore, interactive digital museums or "cloud exhibition halls" can be developed, integrating precious historical footage, photographs, and musical scores. These platforms incorporate virtual tours and interactive Q&A modules, providing students with self-directed exploration opportunities.

Promote project-based and creative learning. Digital resource platforms can effectively support project-based learning (PBL) and creative practices, transforming students from passive listeners into active explorers and creators. For example, students could be guided to plan a complete online concert themed around revolutionary music, taking charge of the entire process from song selection, arrangement, production to online promotion. During this process, students need to conduct in-depth research on the creation background, historical significance, and artistic characteristics of the songs. Meanwhile, an "Online Music Arrangement Lab" could be

established to encourage students to use digital audio workstations (such as Cubase) or AI composition tools (like AIVA) to adapt or reinterpret classic revolutionary melodies, or even create new musical pieces for specific historical events. This approach greatly stimulates students' participation and creativity. Additionally, role-playing is another effective method, where students can assume the roles of revolutionary musicians or historical figures. Through background research and scenario simulations, they can vividly recreate the creative process of revolutionary music, deepening their understanding.

(3)Expand practical scenarios to promote the integration of knowledge and action

The education of red music should not be limited to the classroom, but should go to the social classroom, and deepen the cognition and emotional identification in practical activities. As shown in the following table.

Table 1. Intra-and extra-school practical initiatives

Practical dimension	Core measures
Deepen in-school practice	To build a regular and branded campus music activity system, so that students can change from "listeners" to "participants" and "creators".
Connect to social classroom	The music practice is extended from the campus to the broader social and historical scene, realizing the combination of "small classroom of ideological and political education" and "big classroom of society".
Promote school-local collaboration	Colleges and universities have jointly established practice bases with local red venues and cultural institutions, forming a virtuous cycle of complementary resources and joint talent cultivation.

As shown in the table, various practical activities should be meticulously designed with components like "listening, observing, questioning, researching, singing, and creating," enabling students to gain immersive experiences through diverse roles such as tour guides, conductors, and musicians. The key lies in guiding students to reflect and internalize their musical experiences, transforming external auditory engagement into spiritual resonance. Music practice should not remain short-term initiatives but should be institutionalized through credit systems and recognition mechanisms. Building a collaborative education ecosystem involving schools, families, and society is equally crucial. Activities like "Little Hands Pull Big Hands: Red Songs Sing in Every Home" can extend their influence to families and communities. Design immersive cultural immersion activities. Leveraging the interactivity of digital resources, three classroom activity models can guide students from "perception" to "participation" and ultimately to "creation." By integrating historical elements into classroom settings through AR technology—such as virtual scenes of "The Red Army's Long March Passing Through Hometown" when learning "Yingshanhong" —students can "step into" historical narratives through song performances, experiencing the close bond between military and civilians. In digital platforms, students are assigned roles such as "composers," "historical narrators," and "music critics." They work in groups to gather materials and stage short plays, such as simulating the creative team's discussion of how to express the theme "the old society turned people into ghosts, while the new society transforms ghosts back into humans" through music. Digital creation activities involve using basic music production software (like GarageBand) to compose music for revolutionary stories, rewrite melodies for classic lyrics, or create short videos and animations with revolutionary themes. Through these creative processes, students deepen their understanding, such as composing a new "Nanmowan-style" song for the "poverty alleviation" campaign.

Promoting Students 'Practical Achievements. Outstanding student creations like adapted musical works and research reports should be showcased through digital platforms and social media. This not only motivates students but also amplifies the influence of revolutionary music culture among young people. For instance, students' adaptations of classic revolutionary songs could be produced as high-quality audiovisual content, shared on mainstream music platforms, campus official accounts, and short-video social media channels. Paired with vivid creation stories and contextual introductions, these materials allow young learners to experience the charm of

revolutionary music through listening. Research reports exploring the historical roots and cultural significance of revolutionary music can be compiled into visually rich posts or special pages, featuring key insights, compelling data, and exemplary cases. These should be widely disseminated through platforms like Xuetong APP, cultural news websites, and student communities to spark deeper reflection and emotional resonance among youth. Through these diverse promotional efforts, students' talents are fully showcased, fostering a sense of achievement and pride that further ignites their passion for practical engagement and creative work. Simultaneously, revolutionary music culture becomes more accessible and appealing to young audiences, subtly strengthening their identification with and commitment to preserving revolutionary heritage. This approach ensures revolutionary music culture thrives with renewed vitality in the new era.

5. Reflections on Promoting the Application of Digital Classroom Resources of Red Music

(1) Strengthen top-level design and improve resource construction standards

The establishment of an authoritative database is jointly led by education authorities, cultural institutions, and universities to develop national standards for the digital collection, classification, and cataloging of red-themed music resources, thereby preventing redundant development and the proliferation of low-quality materials. Aligning with primary and secondary school curriculum standards, these digital resources will be benchmarked against existing textbooks to create supporting teaching guides and case study repositories. Clear application objectives will be defined for different educational stages (e.g., emotional enlightenment for elementary students, historical understanding for middle schoolers, and value analysis for university students).

Teachers serve as vital connectors in resource application. Through specialized training, educators should develop three core competencies: First, the ability to curate and integrate digital resources—selecting content tailored to students' learning needs while aligning with educational objectives. Second, proficiency in utilizing technological tools such as VR devices, interactive whiteboards, and online collaboration platforms. Third, the capacity to design effective instructional activities and maintain value-driven guidance, ensuring that technological applications remain rooted in educational principles rather than excessive entertainment, thereby accurately conveying the revolutionary spirit.

(2)Optimize the reform of evaluation to ensure fairness and accessibility

To establish a diversified immersion effect feedback mechanism, we need to build an evaluation system that balances knowledge, emotion, and behavior to avoid "formalistic" applications. By tracking students 'resource usage through digital platforms (such as viewing duration of historical footage, frequency of interactive participation, and revision records of creative works), we can analyze their engagement and comprehension depth. Ultimately, methods like questionnaires, group interviews, and work analysis will be employed to assess students' recognition of the Red Spirit. For example: After learning to sing "Me and My Motherland," observe whether students actively share personal stories related to national development. Subsequently, encourage students to extend classroom learning beyond school boundaries, such as participating in campus radio programs, community performances, or short video dissemination themed around Red music. Through practical actions, we can verify the effectiveness of immersion education.

Through the "Express Classroom" and "Dual-Teacher Instruction" models, high-quality digital red-themed music resources are delivered to schools in rural and remote areas. To lower technical barriers, lightweight and low-cost digital tools (such as WeChat Mini Programs and offline resource packages) are developed to adapt to varying hardware conditions across schools.

Meanwhile, clear copyright ownership for resource sharing is established, along with data encryption and access control mechanisms to prevent misuse or tampering of resources.

(3) Create a campus cultural atmosphere and extend the scene of immersion

Consolidating the nurturing effects of classroom education requires coordinated efforts from the campus environment. Establish digital music corners in public areas like campus radio stations, libraries, and corridors to play revolutionary songs with rolling displays of their creative backgrounds. Regularly organize themed practical activities such as the "Digital Revolutionary Music Composition Competition" and "Virtual Revolutionary Concert" to deepen students' emotional engagement through participation. Foster collaborative education among families, schools, and communities. Through parent workshops and community practices, guide families and society to jointly focus on revolutionary music education, forming a three-dimensional nurturing network integrating "classroom + campus + society".

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The digital transformation of red cultural resources has pioneered innovative approaches for patriotism education in the new era. By integrating the "Ruhua" educational philosophy, the inheritance of revolutionary spirit has evolved from "indoctrination" to "subtle immersion". In practice, we must consistently uphold the principle of "technology as the foundation and education as the soul". Through standardized resource development, application-oriented teaching scenarios, professional teacher training, and diversified evaluation systems, digital red cultural resources should truly enter classrooms and resonate with students' hearts. This enables learners to perceive historical significance through melodies and strengthen convictions through immersive experiences, ultimately cultivating new-era talents capable of shouldering the great mission of national rejuvenation. This not only preserves and inherits red culture, but also provides a vivid response to the fundamental question: "What kind of people to cultivate, how to cultivate them, and for whom to cultivate them".

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