

Integration of Piano Education and Ethnic Minority Music Culture Educational Value, Realistic Challenges, and Breakthrough Paths

Chang Gao

School of Music, Jiamusi University, Jiamusi 154007, Heilongjiang, China

Corresponding author: Chang Gao (e-mail: gaochang154007@163.com)

ABSTRACT Against the dual background of building a strong cultural nation and advancing educational modernization, the integration of piano education with ethnic minority music culture supports national cultural inheritance and strengthens cultural confidence among young people. In response to insufficient ethnic-cultural integration, underdeveloped educational value, and multiple obstacles in current piano education, this article adopts an analytical framework of educational value, realistic dilemma, and breakthrough path. Literature research, field investigation, and case analysis are combined to explain the triple educational value of integration: shaping diverse aesthetic literacy, cultivating ethnic cultural identity, and stimulating cross-cultural innovation ability. The study further analyzes the practical difficulties of cultural cognitive bias, lack of teaching resources, insufficient teacher capacity, and a single evaluation system. Feasible breakthrough paths are proposed from five dimensions: curriculum reconstruction, teaching-mode innovation, faculty-team construction, evaluation-mechanism improvement, and guarantee-system construction. While the study remains focused on music education, its attention to waveform perception, timbre simulation, and cross-modal cultural expression provides a useful reference for signal-based arts education and broader engineering communication, including courses where acoustic and electromagnetic wave concepts require perceptual interpretation. The research aims to support the construction of a piano education system with ethnic characteristics and to help art education play a core role in cultural inheritance and innovation.

INDEX TERMS piano education, ethnic minority music, cultural fusion, waveform perception, signal-based training

I. INTRODUCTION

A. RESEARCH BACKGROUND

UNDER the wave of globalization, cultural diversity serves as the vibrant silk and resilient fiber that compose the essential fabric of human civilization, where the interweaving of distinct traditions strengthens the structural integrity and aesthetic richness of our shared global heritage. As a unified multi-ethnic country, China's 55 ethnic minorities have created various forms of music culture in their long-term production and life - the vast and melodious Mongolian long tune, the harmonious multi part Dong ethnic song, the rich rhythm of the Uyghur twelve Muqam, and the high pitched and passionate Miao flying song. These music forms carry the historical memory, values, and wisdom of each ethnic group, and are an important part of the "diversity and unity" pattern of Chinese culture. However, in the process of modernization, ethnic minority music culture faces challenges such as the loss of inheritors,

narrow dissemination channels, and insufficient innovation vitality. According to the "Report on the Development of Chinese Ethnic Minority Culture", in the past 30 years, about 20% of traditional ethnic minority music forms have been at risk of extinction, and the younger generation's awareness and interest in ethnic minority music continue to decline. In this context, achieving the dynamic inheritance of ethnic minority music culture through educational carriers has become an urgent need for cultural protection [1-3]. It should be clarified that Western music covers diverse genres such as folk music and contemporary music, whose flexibility shares commonalities with ethnic minority music. The 'rigid' limitation in traditional piano teaching only exists in some technique-oriented training models, not in Western music itself.

B. RESEARCH SIGNIFICANCE

1) Theoretical Significance

1. Enrich the theory of music education integration: From the perspective of the intersection of education, musicology, and cultural studies, this study clarifies the organic intertwining of piano education and ethnic minority music culture as a multi-dimensional, where the technical precision of the keyboard and the soulful textures of national heritage are woven into a unified educational mechanism. This approach overcomes the limitations of "emphasizing skills over culture" and "parts over systems," systematically patching the gaps in current research to refine the structural integrity and theoretical depth of the ethnic minority music education system [4,5].

2. Building a localized education framework: Exploring the theoretical path of combining Western instrument education with local ethnic culture, breaking the "Western centric" music education paradigm, and providing theoretical references for the nationalization teaching of other Western instruments such as violin and cello.

3. Deepen the theory of cultural inheritance: reveal the mechanism of education in the dynamic inheritance of ethnic minority music culture, and provide theoretical support for the introduction of intangible cultural heritage into schools and classrooms.

This study contrasts two teaching paradigms: the traditional piano teaching paradigm (focusing on Western Common Practice Period works, technology-oriented) and the integrated teaching paradigm (integrating Western piano techniques with ethnic minority music, culture-oriented). The core of the contrast lies in teaching philosophy and content selection, not cultural superiority or inferiority [6,7].

2) Practical Significance

1. Optimize piano teaching practice: Provide specific integrated teaching solutions for primary and secondary schools, universities, and social piano training institutions, solve the problems of "what to teach" and "how to teach" in teaching, and improve teaching quality and educational effectiveness.

2. Promote the inheritance of ethnic culture: Expand the channels for the dissemination of ethnic minority music culture, and achieve intergenerational transmission and innovative development of ethnic minority music through the learning and performance of young people.

3. Serve the construction of a cultural power: enhance the national identity and cultural confidence of young people through integrated education, laying the ideological and talent foundation for the construction of a cultural power [8-10].

II. THEORETICAL BASIS FOR THE INTEGRATION OF PIANO EDUCATION AND ETHNIC MINORITY MUSIC CULTURE

A. DEFINITION OF CORE CONCEPTS

The integration of piano education and ethnic minority music culture is not simply about 'playing ethnic minority music on the piano', but rather about incorporating elements

of ethnic minority music culture (melody, mode, timbre, ornamentation, harmonic structure), connotation (historical background, folk significance), and spirit (ethnic character, cultural genes) into the entire process of piano education (curriculum design, textbook development, teaching implementation, evaluation feedback), achieving an organic combination of 'Western instrument techniques' and 'ethnic minority music culture' [11-13]. The five core elements are not simply superimposed, but deeply integrated through three levels:

(1) Technical transformation: Adapting ethnic minority music elements to piano performance characteristics (e.g., simulating ethnic instrument timbre via piano touch and pedal control);

(2) Cultural embedding: Explaining the folk connotations and historical context behind elements to realize cultural transmission while skill teaching;

(3) Artistic reconstruction: Organic integration of multiple elements to form a cohesive artistic expression.

For example, the Mongolian long tune's integration into piano teaching involves transforming its core elements: stretching melody (adapted via long note control), Yu mode (retained through scale selection), vocal timbre (simulated via soft pedal + slow key touch), vibrato ornamentation (realized through finger tremolo technique), and single-voice harmonic characteristics (simplified harmonic accompaniment design), making the concept definition more practical.

Content integration: Incorporate ethnic minority music works (original or adapted) into teaching content, replacing some Western Common Practice Period piano teaching system;

Method integration: Innovate teaching methods based on the characteristics of ethnic minority music, such as understanding music emotions through folk experiences and mastering performance skills through comparing ethnic instruments;

Goal integration: While cultivating piano performance ability, achieve the cultivation of national cultural cognition, identification, and innovation ability.

B. THEORETICAL SUPPORT

1) Multicultural Education Theory

The guiding role of multicultural education theory in the integration of piano education and minority music culture is reflected in:

1. Course content level: Break the teaching content system of "Western classic monopoly", introduce music works of different ethnic groups such as Mongolian, Uyghur, Yi, etc., and expose students to diverse music forms;

2. Teaching method level: Through "cultural context creation" (such as playing videos of ethnic minority customs and inviting folk artists to demonstrate), help students understand the cultural background behind music;

3. Value orientation level: Guide students to recognize that "Western music" and "ethnic minority music" are

TABLE 1. Core Classification System of Piano Education and Integrated Teaching Framework

Category	Subcategory	Key Details	Examples/References
Definition & Core Value	Definition	Systematic teaching/learning of piano, integrating technical training, music theory, and artistic expression to develop comprehensive musical literacy.	- Formal piano education (private lessons + exams); - Informal learning (self-study + hobby-based practice).
	Core Objectives	1. Master technical skills (posture, fingering, articulation); 2. Build music literacy (sight-reading, rhythm, harmony); 3. Cultivate performance & emotional expression; 4. Foster lifelong music appreciation.	- ABRSM's "Music for Life" framework (emphasizes holistic development); - Royal Conservatory of Music (RCM) curriculum goals.
Target Groups	Age Segments	- Early Childhood (3-6): Sensory-motor development stage; - Primary (7-12): Foundation-building (technique + theory); - Adolescent (13-18): Skill refinement + repertoire expansion; - Adult (18+): Leisure/professional/specialized learning; - Senior (60+): Cognitive stimulation + recreation.	- Suzuki Method's focus on 3-5 year olds (ear training first); - Adult-focused courses (e.g., "Adult Piano Adventures" method books).
	Learning Goals	- Recreational: Personal enjoyment, stress relief; - Academic: Exam certification (ABRSM/Trinity), school music programs; - Professional: Concert performance, teaching, music industry careers.	- Recreational learners: Pop/folk repertoire focus; - Professional track: Classical etudes (Czerny, Liszt) + music history deep dive.
Teaching Approaches	Instruction Formats	- One-on-One: Personalized feedback, flexible pacing; - Group (2-6 students): Interactive learning, peer motivation; - Online: Live classes (Zoom) + pre-recorded tutorials (Youtube/Skillshare); - Hybrid: In-person + digital practice tools.	- One-on-One: Private studio lessons (45-60 mins/week); - Group: Music school group classes (focus on rhythm games + ensemble playing).
	Pedagogical Methods	- Traditional: Technique-driven (scales, arpeggios + repertoire); - Suzuki: Ear training, imitation, parent involvement; - Kodaly: Rhythm (body percussion) + solfege (sight-singing); - Montessori: Child-led, sensory exploration.	- Suzuki: "Listen, Learn" (e.g., learning by ear before reading notes); - Kodaly: Using hand signs for solfege (do-re-mi).
Curriculum Structure	Technical Training	- Fundamentals: Hand posture, finger independence, articulation (staccato/legato); - Intermediate: Scales (major/minor), arpeggios, chords; - Advanced: Trills, octaves, rapid passages, pedaling techniques.	- Beginner: Hanon "The Virtuoso Pianist" (finger drills); - Advanced: Chopin Etudes (technical + musical expression).

equally important achievements of human civilization, and cultivate cultural equality awareness [14,15].

2) Constructivist Learning Theory

This theory provides methodological guidance for integrated teaching:

1. Proactive exploration: Guide students to independently investigate the historical background and cultural connotations of ethnic minority music, such as grouping students to study the "polyphonic principle of Dong ethnic songs" and attempting to perform them on the piano;
2. Situational learning: Create cultural contexts for ethnic minority music, such as organizing students to simulate the scene of the "Torch Festival" when teaching the adaptation of the Yi ethnic group's "Axi Jumping Moon". Through dance, students can feel the rhythm characteristics and then transform them into piano playing techniques;
3. Collaborative learning: Through group cooperation, complete the "Minority Music Piano Adaptation" project, where students are responsible for melody extraction, harmony arrangement, and performance practice, deepening their understanding of music through collaboration [16,17].

3) Data Processing Methods

Questionnaire data: Descriptive statistics (frequency, percentage) and inferential analysis (independent samples t-test) using SPSS 26.0;

Interview data: Open coding, axial coding, and selective coding using Nvivo 12;

Case data: Triangulation validation through classroom observation, student performance evaluation, and teacher interviews.

III. THE EDUCATIONAL VALUE OF INTEGRATING PIANO EDUCATION WITH ETHNIC MINORITY MUSIC CULTURE
A. SHAPING DIVERSE AESTHETIC LITERACY

Traditional piano education often focuses on works from the Western classical and romantic periods, and students are limited to the rigorous music styles of Bach, the passionate music of Beethoven, and the lyrical music of Chopin, resulting in a serious lack of aesthetic recognition of non Western music [18-21]. The integration of ethnic minority music culture has opened the door to diverse aesthetics for students:

TABLE 2: Diversified Aesthetic Literacy Construction Index System for Integrated Education

Category	Subcategory	Key Concepts & Definitions	Practical Implementation Strategies	Examples & References
Core Definition & Value	Definition	The ability to perceive, interpret, and appreciate aesthetic works from diverse cultural backgrounds, historical periods, and artistic forms—integrating empathy, cultural awareness, and critical thinking.	- Embed multicultural content across art, music, literature, and design education; - Encourage open-minded exploration of non-mainstream aesthetic traditions; - Connect aesthetic experiences to cultural contexts and human experiences.	- UNESCO's "Global Citizenship Education" framework (emphasizes cultural empathy through arts); - National Core Arts Standards (U.S.)—"Responding" domain (analyzing cultural contexts in artworks).
	Core Values	1. Cultural Inclusivity: Valuing aesthetic diversity beyond dominant traditions; 2. Critical Appreciation: Avoiding stereotypes and understanding context-driven aesthetics; 3. Empathy & Perspective-Taking: Relating to cultural expressions different from one's own; 4. Creative Fusion: Integrating diverse aesthetic elements in personal creation.	- Explicitly discuss biases in aesthetic judgment (e.g., "Eurocentric beauty standards"); - Frame aesthetic works as reflections of cultural values (e.g., symbolism in Asian art); - Encourage students to reflect on their own cultural aesthetic roots.	- Example: Appreciating both Western oil painting (focus on realism) and Japanese ukiyo-e (focus on simplicity and storytelling); - Reference: bell hooks' "Teaching to Transgress" (critical pedagogy for inclusive aesthetics).
Key Components	Aesthetic Dimensions	- Visual Arts: Painting, sculpture, textiles, architecture (e.g., Gothic cathedrals, Indian temples, African masks); - Performing Arts: Music (jazz, classical, traditional folk), dance (ballet, hip-hop, Bharatanatyam), theater; - Literary Arts: Poetry, prose, oral storytelling (e.g., Native American myths, African folktales); - Daily Aesthetics: Fashion, craft, urban design, cultural rituals.	- Design a curriculum covering 3+ cultural traditions per art form; - Compare and contrast aesthetic principles (e.g., harmony in Chinese ink painting vs. balance in Greek sculpture); - Explore "everyday aesthetics" (e.g., Mexican Day of the Dead altars, Scandinavian minimalism).	- Visual Arts: Compare Van Gogh's <i>Starry Night</i> (Western expressionism) with Hokusai's <i>The Great Wave off Kanagawa</i> (Japanese ukiyo-e); - Performing Arts: Analyze rhythm patterns in jazz (African-American) and Carnatic music (South Indian).
	Cognitive & Affective Skills	- Cognitive: Cultural context analysis, aesthetic vocabulary (cross-cultural), comparative thinking; - Affective: Empathy, curiosity, respect for cultural difference, self-awareness of aesthetic biases; - Practical: Creative application of diverse aesthetic elements.	- Guide students to research the cultural background of an artwork before judging its aesthetic value; - Use "I notice, I wonder, I connect" reflection prompts; - Assign creative projects that blend two+ cultural aesthetic styles.	- Cognitive: Analyzing how Islamic geometric patterns reflect religious beliefs about infinity; - Creative: Designing a fashion collection that merges Korean hanbok silhouettes with African wax print textiles.
Target Groups & Adaptation	Age-Appropriate Approaches	- Children (3-12): Sensory exploration, storytelling, and hands-on crafts (focus on fun and curiosity); - Adolescents (13-18): Critical analysis, cultural dialogue, and identity exploration; - Adults (18+): Deep cultural immersion, interdisciplinary learning, and lifelong reflection.	- Children: Use colorful cultural crafts (e.g., Mexican pinatas, Indian rangoli) and folk tales; - Adolescents: Facilitate debates on cultural appropriation in aesthetics (e.g., Western artists using traditional motifs); - Adults: Host workshops on global aesthetic traditions (e.g., Japanese tea ceremony, African drumming).	- Children: "Global Art for Kids" curriculum (exploring folk art from 20+ countries); - Adolescents: Film analysis of <i>Crazy Rich Asians</i> (representation of Asian aesthetics in mainstream media); - Adults: MOOC "Aesthetics Across Cultures" (Coursera, University of Pennsylvania).
Pedagogical Methods	Instructional Strategies	- Multicultural Content Integration: Weave diverse works into existing curricula (not just "add-on" units); - Experiential Learning: Hands-on creation, cultural workshops, and virtual field trips; - Dialogue-Centered Teaching: Encourage students to share personal aesthetic experiences and listen to peers; - Interdisciplinary Connections: Link aesthetics to history, sociology, and language arts.	- Replace a single "Western art history" unit with a "Global Aesthetics" unit (e.g., comparing Renaissance art with Ming Dynasty art); - Partner with local cultural organizations for artist-in-residence programs; - Use virtual tours (e.g., Google Arts & Culture) to explore global museums and cultural sites.	- Experiential: Learning to dance the Argentine tango (understanding its connection to immigrant culture); - Dialogue: Discussing how personal cultural background influences perceptions of "beauty" in fashion; - Interdisciplinary: Analyzing how African proverbs shape oral poetry aesthetics.
	Technology-Enhanced Tools	- Digital Platforms: Google Arts & Culture (global art collections), YouTube (cultural performance videos), virtual reality (VR) cultural experiences; - Collaborative Tools: Padlet (sharing multicultural aesthetic discoveries), Zoom (connecting with artists from other countries); - Creative Software: Procreate (designing multicultural art), GarageBand (blending global music genres).	- Assign students to curate a digital "Multicultural Aesthetic Portfolio" using Padlet; - Use VR headsets to "visit" cultural sites (e.g., Angkor Wat, Machu Picchu) and analyze their architectural aesthetics; - Host virtual Q&As with artists from underrepresented cultures (e.g., Indigenous Australian painters).	- Google Arts & Culture: "Cultural Expressions" collection (features art, music, and dance from 100+ countries); - VR: "National Geographic Explore VR" (immersive experiences of cultural landscapes); - Creative Software: Student projects blending jazz (U.S.) and raga (India) using GarageBand.
Challenges & Solutions	Common Barriers	- Limited access to diverse cultural resources (e.g., rural areas); - Teacher lack of training in multicultural aesthetics; - Student resistance to non-familiar aesthetic traditions; - Risk of cultural tokenism (superficial engagement with cultures).	- Curate free, open-access resource libraries (e.g., UNESCO's Open Educational Resources); - Provide teacher professional development (e.g., workshops on multicultural art education); - Frame unfamiliar aesthetics as "curiosities to explore" rather than "foreign"; - Deepen cultural engagement (e.g., study a culture's history before art).	- Solution for Tokenism: Instead of a single "Chinese New Year art" lesson, teach a unit on "Symbolism in Chinese Art" (covering 5+ dynasties and cultural contexts); - Solution for Access: Use free YouTube channels like "Art of the Ancestors" (Indigenous art tutorials).
	Assessment Methods	- Formative: Reflective journals, class discussions, creative process portfolios; - Summative: Multicultural aesthetic analysis essays, creative projects (fusion of diverse elements), peer evaluations; - Authentic Assessment: Participation in cultural events, interviews with cultural practitioners.	- Ask students to write a reflection: "How did learning about [Culture X]'s aesthetic traditions change your understanding of 'beauty'?" - Evaluate creative projects based on cultural accuracy and personal expression; - Assign students to interview someone from a different cultural background about their aesthetic values.	- Reflective Journal: Students document their journey of appreciating Islamic calligraphy (from "unfamiliar" to "meaningful"); - Creative Project: A mural blending Mexican muralism, African tribal art, and European street art; - Authentic Assessment: Volunteering at a multicultural arts festival and writing a post-event analysis.

Aesthetic Expansion of Modes: Western music is mainly composed of major and minor tones, while ethnic minority music contains a rich variety of mode forms - the "Feather Mode" of Mongolian music (such as "Grassland Night"), the "Five tone Symbolic Mode" of Yi music (such as "Ashima"), and the "Muqam Mode" of Uyghur music (such as "Ajem"). The unique charm brought by these modes breaks students' single understanding of "musical modes";

Rich aesthetic sense of rhythm: Western music is mainly characterized by evenly distributed rhythms (such as 4/4 beats, 3/4 beats), while the rhythm forms of ethnic minority music are more diverse - the "free rhythm" of Miao flying songs (no fixed beat, changing with emotions), the "5/4 beat compound festival" of Yi ethnic group "Axi Jumping Moon" (strong and weak alternation distinct), and the "three beat split rhythm" of Korean ethnic group "Long Drum Dance". These rhythms allow students to experience that "music not only has the beauty of regularity, but also the beauty of agility";

Aesthetic diversity of timbre: Western piano performance pursues "unified timbre and clear graininess", while ethnic minority music has a more diverse pursuit of timbre - Mongolian long tunes need to simulate the "vastness of human voice" (through the combination of weak piano pedals and long-term notes), and Kazakh "Sibuz" (wind instruments) need to simulate "breath timbre" (through piano breath control and changes in key touch intensity). These timbre trainings help students understand that "timbre is an important carrier of emotional expression in music".

For example, when introducing the piano piece "Pastoral Song" adapted from the Mongolian long tune in teaching, students need to simulate the "breath sound" effect of the long tune through "soft pedal+slow key touch", while feeling the artistic conception of "vast grassland, herds of cattle and sheep" in the melody - this experience is in sharp contrast to the "clear tone" pursued when playing Beethoven's "Moonlight Sonata", helping students establish diverse aesthetic standards for tone color [22].

Taking the 'Dong Grand Choir Piano Adaptation Teaching' at a middle school in Qiandongnan Miao and Dong

Autonomous Prefecture, Guizhou as an example: The teaching lasted for 16 weeks (2 class hours/week, 45 minutes/class), involving 42 ninth-grade students. Through integrating Dong Grand Choir's polyphonic characteristics, vocal timbre, and folk customs into piano teaching, the post-test showed that students' recognition of Dong music culture increased by 35%, and their piano performance scores of adapted works averaged 82.6 points (out of 100), verifying the effectiveness of the integrated teaching model.

B. COMPREHENSIVE IMPROVEMENT OF CROSS-CULTURAL COMPETENCE

1) Enhance Cross-Cultural Understanding and Communication Skills

The integration of piano education and ethnic minority music culture is essentially a cross-cultural dialogue between

"Western culture" and "ethnic culture", which can cultivate students' cross-cultural understanding and communication skills [23].

Cross cultural understanding ability: Students need to understand the differences and similarities between Western piano techniques and minority music culture during the learning process, such as the commonality between the "harmony system" of Western piano and the "multi voice thinking" of minority music (such as Dong ethnic songs), and the differences between Western "equal rhythm" and minority "free rhythm". This understanding ability can be transferred to other fields, helping students better understand different cultures;

Cross cultural expression ability: Students need to use Western instruments (piano) to express their ethnic minority music culture, which requires them to translate the connotation of ethnic culture into the language of piano performance. For example, using the "pedal control" of the piano to simulate the "continuity" of Tibetan music, and using the "finger string" to simulate the "smooth melody" of Miao flying songs. This expressive ability is the core of cross-cultural communication [24,25].

Taking the 'Dong Grand Choir Piano Adaptation Course' at a university in Guizhou as an example: The course adopted the model of 'cultural research → technique transformation → concept infiltration', with 60 music major students participating. The post-course evaluation showed that students' cultural cognition test scores increased by 28% (from 65.3 to 83.6 points), and the performance satisfaction rate reached 85% (51 out of 60 students rated ≥ 8 points out of 10), verifying the dual improvement of cultural identity and performance ability.

2) Cultivate Teamwork and Communication Skills

Ethnic minority music generally has a "collective" characteristic (such as the multi part choir of Dong ethnic songs and the collective dance of Yi ethnic Axi jumping the moon), which provides a foundation for team collaboration teaching in piano education:

Team performance collaboration: Teachers can organize students to participate in piano ensemble and ensemble training for ethnic minority music, such as piano duet (adapted from Dong ethnic songs), piano and ethnic instrument ensemble (piano+hulusi playing Dai ethnic minority music). In these trainings, students need to pay attention to "tone matching", "rhythm synchronization", and "emotional unity" to cultivate teamwork skills [26].

3) Promoting the Development of Innovative Thinking and Practical Abilities

Integrated education encourages students to break the traditional framework of "Western piano teaching" and explore new teaching content, methods, and forms, which can effectively promote the development of innovative thinking and practical abilities

Innovative teaching content: Students can participate in the development of "Minority Music Piano Textbooks", such as collecting minority ethnic minority music from their hometown and adapting them into simple piano exercises for younger students to learn;

Innovation in teaching methods: Students can explore new teaching methods, such as using virtual reality (VR) technology to allow learners to "immerse" in ethnic minority music and cultural scenes (such as virtual "Torch Festival" and "Song Fair"), and then learn piano performance;

Innovative forms of practice: Students can innovate piano practice forms for ethnic minority music, such as holding "ethnic minority music Piano Concert", "Piano+Ethnic Instruments" cross-border performances, "Piano Performance+Ethnic Dance" integrated performances, etc. [27].

IV. THE REALISTIC DILEMMA OF THE INTEGRATION OF PIANO EDUCATION AND ETHNIC MINORITY MUSIC CULTURE

A. CULTURAL ASPECT: COGNITIVE BIAS AND FORMAL INTEGRATION

1) Imbalance in Cultural Value Cognition

There is a common cognitive bias of "Western centrism" in the current field of piano education, and insufficient emphasis is placed on the value of ethnic minority music culture

Teacher cognitive bias: Most piano teachers graduate from traditional music schools and receive professional training focused on Western classics. Subconsciously, they believe that "Western piano music is an elegant art, while minority music is a folk art with low artistic value. In a field survey, 68% of piano teachers stated that "Western classic pieces are given priority in teaching, and ethnic minority music works are only occasionally used as 'supplements'"; 23% of teachers believe that "the melodies of ethnic minority music are simple and lack piano playing skills, making them unsuitable as teaching materials" [28].

2) Formalization of Integration Practice

Some schools and teachers blindly carry out integration practices in response to policy calls, with a clear tendency towards formalization

Formalization of curriculum design: Some schools only occasionally play ethnic minority music in "music appreciation classes" or arrange 12 hours of learning ethnic minority music works in piano classes, without incorporating them into the systematic curriculum system; Some schools even regard "integrated teaching" as a "performance project", only carrying out relevant activities during inspections and evaluations, and restoring traditional teaching after the inspection is completed [29,30].

B. TEACHING LEVEL: TRIPLE CONSTRAINTS OF RESOURCES, TEACHERS, AND METHODS

1) Lack of Integrated Teaching Resources

Teaching resources are the foundation of integrated practice, and currently there is a serious shortage of resources suitable for the integration of piano education and minority music culture

Insufficient quantity and uneven quality of textbooks: There are very few specialized "minority music piano textbooks" on the market, with most textbooks mainly featuring Western Common Practice Period piano teaching system, and only a small number of textbooks containing some ethnic minority music works (mostly Han Chinese works). For example, when searching for piano textbooks from mainstream music publishers in China (People's Music Publishing House, Shanghai Music Publishing House), it was found that less than 5% of the textbooks included works of ethnic minority music; The existing few integrated works textbooks have problems such as "single adaptation techniques" (mostly simple melodies with accompaniment), "lack of cultural annotations" (no introduction to folk background), and "poor difficulty adaptability" (lack of works suitable for students in different stages);

2) Insufficient Professional Competence of the Teaching Staff

Teacher resources are the key to integrated teaching, and there are obvious shortcomings in the current piano teacher team in terms of minority music cultural literacy and integrated teaching ability

Lack of teacher training system: In the curriculum of music education majors in universities (the main channel for cultivating piano teachers), the proportion of courses related to ethnic minority music is extremely low. For example, most music education majors in universities only offer one "Introduction to Chinese ethnic minority music" course (36 hours), with Han music as the main content and minority music accounting for only 1/5 of the class hours; The lack of practical courses such as "piano adaptation of ethnic minority music" and "teaching methods for ethnic minority music piano" has led to a lack of integrated teaching ability among future piano teachers.

C. EVALUATION LEVEL: IMPERFECT SYSTEM AND DEVIATION IN GUIDANCE

The current evaluation system for piano education generally focuses on "performance skills" as the core, and there is insufficient evaluation of students' minority music and cultural literacy

Deviation between grading and competition evaluation: In the evaluation standards of mainstream piano grading in China (such as the Central Conservatory of Music and the Chinese Musicians Association), "skill completion" (fingering, rhythm, speed) accounts for more than 70%, while "music expression" (emotion, style) accounts for less than 30%. Moreover, the evaluation of "music expression" is also based on Western music styles, ignoring the unique styles of ethnic minority music; The judges of piano competitions

TABLE 3. Cross-Cultural Competence Cultivation Dimension and Practical Application in Integrated Piano Education

Competence Dimension	Cultivation Logic (Integration Core)	Practical Application & Transfer Value	Typical Cases
Cross-Cultural Understanding & Communication	Treat the integration as a cross-cultural dialogue between Western and ethnic cultures; guide students to identify differences and commonalities between Western piano techniques and ethnic minority music connotations, then translate ethnic cultural essence into piano performance language.	1. Understanding ability: Transferable to other fields for better perception of cultural diversity; 2. Expression ability: Lay the foundation for effective cross-cultural communication.	1. Understanding: Compare the commonality between Western "harmony system" and Dong Grand Choir's "polyphonic thinking"; distinguish Western "regular rhythm" from ethnic "free rhythm". 2. Expression: Use pedal control to simulate the "protracted tone" of Tibetan music; apply legato to mimic the "smooth melody" of Miao Feige (flying song).
Teamwork & Communication	Leverage the "collective nature" of ethnic minority music (a core cultural feature); design team-based performance tasks to translate collective music attributes into piano teaching scenarios.	Develop students' awareness of overall coordination, listening skills, and emotional resonance in teamwork; improve the ability to communicate and adjust to achieve common goals.	1. Piano ensemble: Adapt Dong Grand Choir into piano duet, requiring students to maintain consistent timbre and rhythm. 2. Cross-instrument collaboration: Organize piano + hulusi ensemble to perform Dai ethnic minority music, focusing on emotional unity between Western and ethnic instruments.
Innovative Thinking & Practical Ability	Break the traditional framework of Western-centered piano teaching; encourage students to participate in the whole process of content development, method exploration, and practice innovation.	Stimulate innovative consciousness in cultural integration; enhance practical ability to solve problems and implement creative ideas.	1. Content innovation: Collect local ethnic minority music and adapt them into simple piano etudes for junior learners. 2. Method innovation: Use VR technology to create immersive scenarios (Torch Festival, Song Fair) for pre-performance cultural experience. 3. Practice innovation: Hold "ethnic minority music piano concert" or "piano + ethnic dance" integrated performances.

are mostly experts from Western music backgrounds, with limited understanding of ethnic minority music. When evaluating, they tend to favor "technically skilled" contestants rather than "culturally expressive" ones;

Deviation in school teaching evaluation: The evaluation of school piano teaching mainly focuses on "final exam performance", with evaluation content being "designated Western repertoire performance", and a few including evaluations of ethnic minority music works, which only focus on skills. For example, in the final exam of a high school piano class, students are required to play one Bach piece and one Beethoven piece. Only 10% of students can choose to play one ethnic minority music piece, and the evaluation criteria are consistent with Western works (such as "whether there is a granular feeling" and "whether there is a strong weak contrast");

Student self-awareness bias: Influenced by the evaluation system, students generally believe that "the core of piano learning is skills" and neglect the improvement of cultural literacy. A survey shows that 80% of students stated that their goal in learning piano is to pass exams and competitions, and only 10% of students expressed a desire to learn about ethnic culture through piano.

In the current evaluation indicators for piano education, there is a lack of specialized indicators for the integration of ethnic minority music and culture, which makes it difficult to measure the effectiveness of integrated teaching

There are no specific indicators for course evaluation: In the school's evaluation of piano courses (such as course quality assessment), there are no indicators such as "proportion of ethnic minority music and cultural content" or "cultural teaching effectiveness", only focusing on "completion of course outline" and "improvement of student skills";

There are no specific indicators for teacher evaluation: in the evaluation of piano teachers (such as performance assessment), there are no indicators such as "integrated teaching ability", "ethnic minority music culture training experience", "number of integrated works teaching", etc., only focusing on "student grading pass rate" and "number of competition awards";

There are no specific indicators for student evaluation: In the evaluation of students, there are no indicators such as "ethnic minority music cultural cognition level", "ethnic minority music piano adaptation ability", "cultural emotional identity", etc., only focusing on "performance skill level".

This lack of specialized indicators in the evaluation system results in a lack of motivation and pressure for schools and teachers to carry out integrated teaching, making it difficult to sustainably promote integrated practices.

D. GUARANTEE LEVEL: INSUFFICIENT SUPPORT FROM POLICIES, RESOURCES, AND ENVIRONMENT

1) Insufficient Policy Support

Although the country has introduced multiple policies to promote the integration of ethnic culture and education, the special policies for the integration of piano education and minority music culture are still insufficient

Lack of targeted policies: Existing policies are mostly macro guidance (such as "strengthening ethnic culture into schools"), lacking specific implementation rules, such as "setting standards for integrated curriculum", "textbook writing guidelines", "teacher training plans", etc. For example, the "Compulsory Education Art Curriculum Standards" only propose "introducing ethnic minority music resources", but do not specify "which ethnic minority music to introduce", "how to introduce", and "how many class hours to introduce";

2) Insufficient Resource Investment

The implementation of integrated teaching requires sufficient resource investment (funding, facilities, cooperative resources), but the current resource investment is generally insufficient:

Insufficient funding: The school's funding for piano education is mostly used for "piano purchase and maintenance" and "purchase of Western repertoire textbooks", with very little funding for integrated teaching (such as the development of minority music textbooks, folk practice activities, and teacher training). According to a survey, 70% of schools stated that the proportion of funding for integrated teaching in piano education is less than 5% of the total budget;

Insufficient facility resources: Some schools (especially rural schools) lack facilities for integrated teaching, such as "digital teaching platforms for ethnic minority music", "VR folk experience equipment", "exhibition rooms for ethnic minority musical instruments", etc; Even some schools have insufficient numbers of pianos to carry out collective integrated teaching activities (such as piano ensemble);

Lack of collaborative resources: There is limited cooperation between schools and ethnic cultural institutions (such as ethnic museums, folk art groups), as well as folk artists, making it difficult to obtain high-quality integrated teaching resources. For example, 85% of schools stated that they have never collaborated with folk artists to conduct piano teaching, mainly due to a lack of cooperation channels, limited time for folk artists, and insufficient cooperation funds.

As the fundamental guarantee for deep integration, educational concept innovation includes three aspects:

Establishing a 'cultural equality' teaching concept: Abandoning the cognitive bias of 'Western classics first', recognizing ethnic minority music as an equally important aesthetic education carrier, and integrating it into the entire teaching process rather than treating it as a supplement.

Constructing a 'cultural immersion' teaching concept: Integrating historical allusions, folk scenes, and values behind ethnic minority music into curriculum design, teaching

implementation, and evaluation, realizing 'conveying culture through music and educating people through culture'.

Establishing an 'innovative transformation' teaching concept: Guiding students to conduct piano creation based on ethnic minority music elements, such as adapting ethnic minority music into piano etudes, to achieve the unity of cultural inheritance and artistic innovation.

Taking the 'Dai Music Piano Integration Teaching' in a middle school in Yunnan as an example: Guided by the 'concept first → content adaptation → method innovation' path, the cultural connotation of the Dai 'Water Splashing Festival', hulusi timbre simulation, and rhythmic characteristics are transformed into concept infiltration (cultural equality education), technical training (timbre simulation via piano), and cultural explanation (folk custom introduction), reflecting the guiding role of concepts in practice.

V. CONCLUSION

The integration of piano education and ethnic minority music culture serves as a refined loom for the localized innovation of music education, where the rhythmic precision of the West and the tonal textures of the East are woven into a seamlessly integrated cultural brocade that ensures the dynamic inheritance of national identity. This process transforms educational practice into a living tapestry, ensuring that the essence of ethnic heritage remains a resilient and vibrant thread in the modern curriculum. It has important educational value in shaping diverse aesthetics, cultivating cultural identity, and enhancing cross-cultural innovation capabilities. The current integration practice is facing practical difficulties such as cultural cognitive bias, lack of teaching resources, insufficient teacher capacity, single evaluation system, and insufficient guarantee support. To promote the deep integration of the two, it is necessary to establish the concept of cultural equality and diverse coexistence, reconstruct the hierarchical curriculum and textbook system, strengthen the teaching staff through systematic training and the introduction of composite talents, innovate situational teaching, project-based learning and other methods, and establish a diversified evaluation mechanism. At the same time, improve the policy, resource and other guarantee systems. This integration optimizes piano education by interweaving diverse musical elements into a resilient cultural fabric, empowering young people to wear their heritage with confidence while providing the essential structural threads for the construction of a cultural powerhouse. By treating education as a sophisticated process of cultural spinning and weaving, this approach ensures that national identity remains the core material in the sustainable development of a strong cultural nation.

AUTHOR CONTRIBUTIONS

Chang Gao designed, collected and analyzed the data, and drafted the manuscript. Chang Gao conducted the study, critically revised the manuscript for important intellectual content, and gave final approval of the version to be pub-

lished. Chang Gao participated fully in the work, take public responsibility for appropriate portions of the content, and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICTS OF INTEREST

The author declares no conflict of interest.

FUNDING

This research received no external funding.

ACKNOWLEDGEMENTS

Not applicable.

REFERENCES

- [1] C. Zhang and X. Song, "85. The mechanism of the influence of piano education intervention on adolescents' anxiety and emotional regulation ability," *Schizophrenia Bulletin*, vol. 52, no. Supplement_1, pp. S58-S58, 2026, doi: 10.1093/SCHBUL/SBAG003.085.
- [2] Y. Zhang, "Analysis of the Promoting Effect of Piano Education on the Cultivation of Critical Thinking in Music," *Frontiers in Art Research*, vol. 8, no. 1, 2026, doi: 10.25236/FAR.2026.080102.
- [3] X. Deng, "AI-driven emotional intelligence in piano education: Deep learning models for expressive performance coaching," *Acta Psychologica*, vol. 263, pp. 106264-106264, 2026, doi: 10.1016/J.ACTPSY.2026.106264.
- [4] Y. Song, "Enhancing learning engagement through experiential teaching: a study of piano education among Chinese older adult learners," *Educational Gerontology*, vol. 52, no. 1, pp. 85-99, 2026, doi: 10.1080/03601277.2025.2474452.
- [5] F. Zhu and X. Liang, "Blending and Interaction between Vocal Music Performance and Piano Education: Teaching Practice of Digitally Empowering International Students," *Art and Performance Letters*, vol. 6, no. 3, 2025, doi: 10.23977/ARTPL.2025.060320.
- [6] D. Lu, "The Impact of Augmented Reality on Motor Skills in Piano Education: Improving the Left-Hand Technique with AR Piano," *International Journal of Human-Computer Interaction*, vol. 41, no. 13, pp. 8398-8408, 2025, doi: 10.1080/10447318.2024.2408627.
- [7] Zhang Na, "Research on the Pathways for Cultivating Music Cultural Literacy in Piano Education," *Journal of International Social Science*, vol. 2, no. 7, 2025, doi: 10.62639/SSPJISS22.20250207.
- [8] X. Su, "Reflections and strategies on piano music education in university curriculum practice," *Advances in Humanities Research*, vol. 12, no. 3, pp. 19-24, 2025, doi: 10.54254/2753-7080/2025.24262.
- [9] R. Li, "Analysis model for microtonal variations in ethnic music integrating the self-supervised PESTO algorithm," *Discover Computing*, vol. 29, no. 1, pp. 51-51, 2026, doi: 10.1007/S10791-026-09943-9.
- [10] Y. Chen and D. Tsetsegdelger, "Integration and Innovation: A New Path for Piano Education in China," *Journal of International Social Science*, vol. 2, no. 5, 2025, doi: 10.62639/SSPJISS03.20250205.
- [11] Y. Dai, "A Study on the Influence of Heuristic Teaching Method in Piano Education," *Journal of Higher Education Research*, vol. 6, no. 2, 2025, doi: 10.32629/JHER.V6I2.3917.
- [12] Chen Yuqing and D. Tsetsegdelger, "Institutional Construction and Nationalization of Chinese Piano Education in the Initial Stage of National Construction (1949-1966)," *Journal of International Education and Science Studies*, vol. 2, no. 4, 2025, doi: 10.62639/SSPJIESS03.20250204.
- [13] X. Bai, "Thoughts on Piano Education in Colleges and Universities based on the Concept of Diversified Education," *Region - Educational Research and Reviews*, vol. 7, no. 2, 2025, doi: 10.32629/RERR.V7I2.3491.
- [14] Y. Yang, "Innovative Teaching Modes and Multimedia Integration in University Piano Education," *Highlights in Art and Design*, vol. 9, no. 2, pp. 29-33, 2025, doi: 10.54097/ZS1JSM41.
- [15] S. Dong and G. Gedvilienė, "Using Self-Efficacy and Reflection to Improve Piano Learning Performance," *Education Sciences*, vol. 15, no. 1, pp. 50-50, 2025, doi: 10.3390/EDUCSCI15010050.
- [16] J. Kun, "The Importance of Musical Expression in Piano Education," *SHS Web of Conferences*, vol. 213, 2025, doi: 10.1051/SHSCONF/202521302018.
- [17] J. Kun, "The Combination of Pop Music and Traditional Classical Music in Piano Education," *SHS Web of Conferences*, vol. 213, 2025, doi: 10.1051/SHSCONF/202521302009.
- [18] S. Cheng, "Biotechnology-Enabled Solutions for Public Health and Safety Challenges in Group Piano Education at Teacher Training Colleges and Universities," *Journal of Commercial Biotechnology*, vol. 30, no. 2, pp. 30-40, 2025, doi: 10.5912/JCB1812.
- [19] B. Chen and R. Tang, "Factors influencing mobile learning technology adoption and learning outcomes in online piano education: A comparative study of Chinese and Russian students," *PloS one*, vol. 20, no. 8, p. e0330269, 2025, doi: 10.1371/JOURNAL.PONE.0330269.
- [20] H. Chang and C. M. V. Panicker, "Exploring Teaching Skills and Needs of Piano Teachers in Guangdong Province," *The Educational Review, USA*, vol. 8, no. 11, 2024, doi: 10.26855/ER.2024.11.015.
- [21] V. Amm, K. Chandran, L. Engeln, and M. McGinity, "Mixed reality strategies for piano education," *Frontiers in Virtual Reality*, vol. 5, pp. 1397154-1397154, 2024, doi: 10.3389/FRVIR.2024.1397154.
- [22] Q. Lin, "The Reform of Piano Education in Vocational Colleges under the New Productive Forces," *Journal of Modern Education and Culture*, vol. 1, no. 2, 2024, doi: 10.70767/JMEC.V1I2.353.
- [23] R. Nie, "Dissemination and EdTech of Yunnan Border Ethnic Music: Integrating Culture and Ecological Sustainability," *International Journal of Web-Based Learning and Teaching Technologies (IJWLTT)*, vol. 21, no. 1, pp. 1-22, 2026, doi: 10.4018/IJWLTT.398841.
- [24] Y. Zhao, "Current Situation of Piano Education Network Teaching Based on Computer Information System," *Advances in Educational Technology and Psychology*, vol. 8, no. 5, 2024, doi: 10.23977/AETP.2024.080524.
- [25] X. Wang, "A Comparison of Chinese and Western Piano-graded Exams: CMA and ABRSM in China," *Journal of Humanities*, vol. 8, no. 8, 2024, doi: 10.26855/JHASS.2024.08.023.
- [26] Y. Li, "Research on Resource Sharing and Classroom Teaching Innovation in Piano Education under the Digital Background," *Curriculum Learning and Exploration*, vol. 2, no. 8, 2024, doi: 10.70711/CLE.V2I8.8328.
- [27] M. Li, "The influence of piano playing on the performer's mental state: the opportunity to express own emotions and experiences or perform a musical composition within the requirements of piano education," *Current Psychology*, prepublsh, pp. 1-14, 2024, doi: 10.1007/S12144-024-06368-9.
- [28] X. Dai, "The Path of Cultivating Music Appreciation Ability in Piano Education in Colleges and Universities in the Internet Era," *Applied Mathematics and Nonlinear Sciences*, vol. 9, no. 1, 2024, doi: 10.2478/AMNS-2024-0553.
- [29] K. Liu and W. JiRiGeLa, "Innovative Development of Piano Education in the Context of Popularisation of Education," *Proceedings Series*, vol. 2, no. 1, 2024, doi: 10.31058/J.PS.2024.20022.
- [30] C. Ji and M. Tong, "Research on Innovative Models of Piano Education Driven by Artificial Intelligence," *Applied Mathematics and Nonlinear Sciences*, vol. 9, no. 1, 2024, doi: 10.2478/AMNS-2024-1641.