

Digital Transformation of Music Education Management and Ethnic Music Inheritance Innovation in Guangxi Zhuang Autonomous Region, China

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Abstract Against the backdrop of global educational digitalization, we investigated how the digital transformation of music education management supports ethnic music inheritance and innovation in Guangxi Zhuang Autonomous Region, China. An explanatory sequential mixed-methods design was proposed. An explanatory sequential mixed-methods design was adopted, including 402 valid questionnaires, 15 semi-structured interviews, and three institutional cases. The results show that the overall digital transformation level of music education management was relatively low ($M = 2.87$), while ethnic music inheritance and innovation remained at a medium level ($M = 3.01$). Digital transformation was strongly and positively correlated with ethnic music inheritance innovation ($r = 0.712$, $p < 0.001$). Regression results further indicated that teachers' dual literacy had the strongest effect on coordinated development ($\beta = 0.328$, $t = 8.12$, $p < 0.001$), followed by special fund investment, policy support, and characteristic digital resource capacity. Our qualitative analysis revealed four challenging issues: fragmented digital resources, insufficient teacher and inherent digital abilities, weak institutional support, and technological innovation versus cultural authenticity. We propose a multi-layered environment comprising ethnic music digital resources, dual-literacy training, virtual-real practice platforms, and multidimensional digital evaluation. Our results have practical implications for ethnic music education management and cultural inheritance in higher education.

Keywords: digital transformation, music education management, inheritance and innovation of ethnic music, Guangxi Zhuang Autonomous Region

1. INTRODUCTION

1.1 BACKGROUND

Digital technology is a driving force in higher education reform, especially in curriculum management, teaching resource allocation, learning assessment, and institutional supervision. In China, the Strategic Action Plan for Educational Digitalization has also proposed digital technology for education management and cultural inheritance. For universities in ethnic minority areas, digital transformation is not only a technical issue, but also a governance issue concerning how local cultural resources can be preserved, taught, evaluated, and disseminated more effectively.

1.2 SIGNIFICANCE OF THE STUDY

Guangxi Zhuang Autonomous Region has rich ethnic music resources, including Zhuang

folk songs, Yao bronze drum music and dance, and Dong Grand Choirs. These are important elements of intangible cultural heritage and cultural identity. The resources are still extremely valuable for higher music education based on offline teaching, personal experience transmission, and unbalanced cultural activities. Hence, the digital revolution of music education management could improve teaching efficiency, enhance cultural communication, and increase sustainable inheritance of ethnic music.

1.3 RESEARCH GAP

Some of the previous studies have discussed using digital tools for classroom teaching or the cultural value of ethnic music inheritance, but little has studied the relationship between digital education

management and ethnic music inheritance from a higher education governance perspective. In addition, the existing literature often includes digital platforms, online courses, or cultural preservation alone, but rarely have shown how curriculum management, faculty development, practice platforms, and evaluation systems interact with ethnic music inheritance innovation. No studies from ethnic populations such as Guangxi have been reported.

1.4 RESEARCH OBJECTIVES

This study aims to:

1. Examine the current level of digital transformation of music education management and ethnic music inheritance innovation in Guangxi universities.
2. Identify the key factors influencing the coordinated development of digital management transformation and ethnic music inheritance innovation.
3. explore the practical dilemmas faced by universities, teachers, administrators, and ethnic music inheritors;
4. Construct an innovation path for integrating digital music education management with ethnic music inheritance.

1.5 RESEARCH QUESTIONS

What is the state of the digital transformation of music education management and the inheritance and innovation of ethnic music in universities in Guangxi?

What are the key challenges and key influencing factors that prevent joint development of management digital transformation, and ethnic music inheritance innovation in Guangxi?

What innovation routes can be mapped in order to promote the digital transformation of music educational management and encourage the newly developed cultural inheritance of ethnic song in Guangxi?

2. LITERATURE REVIEW

2.1 DIGITAL TRANSFORMATION IN MUSIC EDUCATION MANAGEMENT

Recent studies have shown that digital learning for higher education may not only be facilitated through online teaching but also through curriculum coordination, teacher development, learning analytics, sharing, and quality evaluation. In music education, digital tools could also support score visualization, online rehearsal, intelligent feedback, and multimedia resource management. However, most studies emphasize classroom technology,

not the management system for digital music education.

2.2 ETHNIC MUSIC INHERITANCE AND DIGITAL INNOVATION

Research on ethnic music inheritance tends to focus on cultural authenticity, oral transmission, community involvement, and intangible cultural heritage. Digital technology offers new opportunities to record, store, classify, and share ethnic music resources. However, if digitalization focuses on technical presentation (e.g., audio-video storage or visual effects), it might degrade cultural context, performance tradition, and emotions of ethnic music. Therefore, digital development should not replace cultural inheritance but increase its accessibility, continuity, and educational value.

2.3 SYNTHESIS OF PREVIOUS STUDIES

Previous works have argued that digital technology can improve access to education and cultural exchanges. However, they are not in the same research area: educational digitalization studies consider teaching efficiency, platform construction, and learner participation, and ethnic music inheritance studies focus on cultural protection, local identity, and intergenerational transmission. The differences are that educational digitalization studies are technology-driven, and ethnic Music studies are culture-driven. This leaves a research gap: the two views cannot be fully integrated into a single management framework. In this paper, music education management is connected to ethnic music families, and their development is studied in Guangxi universities.

2.4 CONCEPTUAL FRAMEWORK

Based on the research findings and the practice of music education in Guangxi universities, we construct a framework in which digital transformation of music administration is considered as the independent variable, ethnic music inheritance innovation is considered to be a dependent variable, and teachers' dual-literacy, funding, policy support, and digital resource utilization are considered as factors.

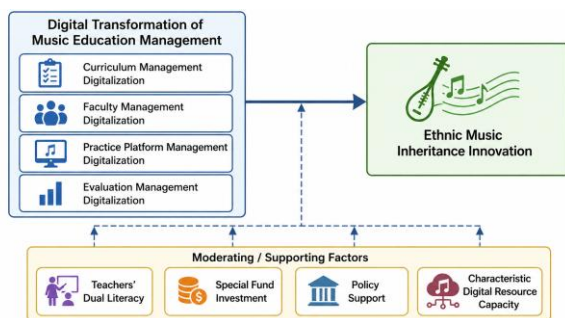


Figure 1. Conceptual framework of the relationship between the digital transformation of music education management and ethnic music inheritance innovation.

The model assumes that curriculum management digitalization, faculty management digitalization, practice platform management digitalized and evaluation management digitalization are major effects of ethnic music inheritance innovation. Teachers' dual knowledge connections digital tools to cultural knowledge, funding, policy support, and ethnic music digital resources provide institutional and material conditions, and thus joint development requires both technology and cultural management skills.

3. MATERIALS AND METHODS

This study adopts an explanatory sequential mixed-methods research design, combining quantitative and qualitative research methods to ensure the rigor and depth of the research findings. This design is highly consistent with the core objectives of this study: it first clarifies the overall status and key influencing factors of management digital transformation and inheritance innovation through quantitative research, and then explores deep-seated dilemmas and constructs a coordinated innovation path system via qualitative research.

3.1 DATA SOURCES

This study draws on four complementary data sources to form a robust evidence chain. First, policy text data: 18 national and local documents (2020–2026) concerning educational digitalization and ethnic music inheritance, including China's National Strategic Action Plan for Educational Digitalization and Guangxi's Action Plan for Ethnic Music Inheritance in Universities.

Second, questionnaire survey data were obtained from music majors and full-time teachers from five representative universities in

Guangxi. A stratified sampling was adopted. First, universities of ethnic music teaching, digital teaching, and regional representativeness were selected. Second, students and teachers were stratified by institutional type and participant. A total of 450 questions were used, and 402 valid answers were collected, including 352 students and 50 teacher queries, with a working response rate of 89.3%.

Third, semi-structured interview data: 15 purposively selected interviewees (6 teachers, 4 education administrators, 3 ethnic music inheritors, 2 students). Each interview lasted 30–40 minutes, fully recorded and transcribed into about 28,000 words of text.

Fourth, case study data: three digital practices at Guangxi Arts University, including the VR bronze drum performance system, Zhuang folk song digital library, and AI-assisted folk song evaluation system.

Based on the core functions of higher education management and the practical needs of ethnic music inheritance and innovation, this study constructs a four-dimensional analytical framework for the coordinated development of the digital transformation of music education management and ethnic music inheritance and innovation. There are 3 parts to the questionnaire: 1) Participant profile, institution, grade, and teaching/learning experience. 2) Digital transformation of music education management based on four dimensions: curriculum management digitalization, faculty management digitalization, practice platform management digitalization, and evaluation management digitalization. 3) Ethnic music inheritance innovation based on learning participation, cultural understanding, digital resource usage, performance, and innovation output. All these measurements were rated on a five-point Likert scale, 1 = strongly disagree. Higher scores indicated digital transformation or innovation.

3.2 RESEARCH PROCEDURES

Policy documents were coded via NVivo 12 to extract core themes, establishing the study's policy foundation.

Questionnaires were adapted from validated scales (Almusaed et al., 2023; Wang & Li, 2025) with good reliability and validity (Cronbach's $\alpha = 0.908$, KMO = 0.862), and formally administered in October–November 2025.

Statistical software packages were used for quantitative analysis (descriptive statistics,

correlation, and regression) to identify status and influencing factors.

Interview data were thematically analyzed to extract key dilemmas, and an innovation path was developed, integrating quantitative findings.

Triangulation was applied to cross-verify results from policies, surveys, and interviews, ensuring research credibility.

4. RESULTS AND DISCUSSION

This section presents the key findings of the study using a mixed-methods approach. First, descriptive statistics and multiple linear regression are used to examine the current status, correlations, and influencing factors of digital transformation in music education management and ethnic music inheritance innovation. Then, thematic analysis of interview data is used to explain the practical dilemmas behind the statistical results. Finally, an integrated discussion and targeted innovation paths are proposed to form a comprehensive understanding of the coordinated development mechanism.

4.1 QUANTITATIVE FINDINGS

Descriptive statistics show that the overall level of digital transformation of music education management in Guangxi universities was low ($M = 2.87$, 5-point Likert scale). Mean 0.00, 0.50, 0 0.001 were interpreted as low, $0 < 3.00$ and $0.25, 0 > 3.50$, and $0 < 0.01$. Overall, ethnic music inheritance and innovation is moderate ($M = 3.01$), which means that even though ethnic music has been maintained to some extent, digital management is not well supported in terms of systematic support. A strong positive relationship between digital transformation and ethnic music inheritances is found between education management and ethnic heritage ($r = 0.712$, $p < 0.002$). According to the correlation interpretation used in this paper, 0 value greater than 0.70 is indicated for large and larger localities. This means that universities that do more digital management often get better results in ethnic heritage innovation. Overall, Research Question 1 shows that digital transformation remains low, but is strongly connected with ethnic heritage preservation.

Among the four management dimensions, curriculum management digitalization scores the highest ($M = 3.02$): 62.3% of universities have established basic digital teaching platforms, yet only 21.6% offer systematic ethnic music online courses. Faculty management

digitalization scores 2.79: only 34.5% of teachers have received systematic digital teaching training, and over 70% of inheritors lack digital teaching tool skills. Practice platform management digitalization scores 2.75: fewer than 30% of universities have built dedicated ethnic music virtual simulation venues, and inter-institutional digital collaboration remains weak. Evaluation management digitalization scores the lowest ($M = 2.71$): more than 80% of universities still use traditional final assessment methods, with little application of AI in skills evaluation.

Multiple linear regression analysis was conducted to identify key factors influencing coordinated development. The model is statistically significant ($p < 0.001$) with an explanatory power of $R^2 = 0.726$. $n = 402$. Control variables included institutional type, teaching experience, and grade level.

Table 1 Regression Analysis of Factors Influencing Coordinated Development

Variable	β	t	P
Teachers' Dual Literacy	0.328	8.12	< 0.001
Special Fund Investment	0.285	7.36	< 0.001
Policy Support	0.217	5.79	< 0.001
Characteristic Digital Resource Capacity	0.176	4.53	< 0.001

Table 1 shows standardized regression coefficients, t, and significance of factors. The regression model was significant ($p < 0.001$), $R^2 = 0.726$, indicating that the four predictors explained 72.6% of coordinated development variance. Teachers' dual knowledge had the most effect ($\beta = 0.328$, $t = 8.12$, $p < 0.001$). Special fund investment was the most influential ($\beta = 0.285$, $t = 7.36$, $p < 0.001$); policy support was the strongest ($\beta = 0.217$, $t = 5.79$, $p < 0.001$), and their characteristic digital resource capacity ($\beta = 0.176$, $t = 4.53$, $p < 0.001$). Overall, teachers' ability to leverage digital applications combined with ethnic music cultural knowledge was the main impact factor on coordinated development. Overall, evaluation management digitalization was the least important factor, which suggests that current universities do not have good digital tools to assess ethnic music learning, performance, and cultural knowledge.

4.2 QUALITATIVE RESULTS RELATED TO RESEARCH QUESTION 2

Thematic analysis of interview data identified four core dilemmas restricting coordinated development.

4.2.1 Fragmented Ethnic Music Digital Resources

Interviewees widely reported that existing digital resources are fragmented and lack systematic interpretation of cultural connotations, historical contexts, and emotional expressions. As one administrator noted: “Most digital libraries are just audio and video files without cultural sorting, so they can’t really support professional inheritance teaching” (Administrator 2, personal communication, November 2025). Many resources also mechanically copy Western classical music models without ethnic-specific design.

4.2.2 Insufficient Dual Literacy of Teachers and Inheritors

Both full-time teachers and inheritors face capability gaps. Teachers lack systematic digital pedagogy training; inheritors struggle with basic digital operation. One teacher commented: “I understand ethnic music deeply, but I don’t know how to design digital lessons to convey its cultural meaning” (Teacher 4, personal communication, November 2025). An inheritor added: “I can sing and perform, but recording, editing, and online teaching are very difficult for me” (Inheritor 1, personal communication, November 2025).

4.2.3 Weak Institutional Support Mechanisms

Universities lack stable funding, clear cross-departmental collaboration mechanisms, and effective incentives. As one administrator stated: “There is no special budget for ethnic music digitalization, and no formal cooperation between the music school, information center, and cultural heritage bureau” (Administrator 3, personal communication, November 2025). Incentives for digital inheritance practice are also insufficient.

4.2.4 Tension Between Digital Form and Cultural Authenticity

Some interviewees expressed concern that digital transformation overly emphasizes technological form over cultural core. One teacher warned: “If we only pursue cool VR effects but lose the genuine singing style and cultural spirit, digitalization will harm inheritance” (Teacher 5, personal

communication, November 2025). Effective methods to use digital tools while preserving authenticity remain underdeveloped.

Overall, the qualitative results show that digital evolution has not yet completely empowered ethnic music inheritance: the main challenges are not technical, but organizational, cultural, and human-resource-related.

5. DISCUSSION

The results generally support the research hypothesis that digital transformation of music education management positively promotes ethnic music inheritance and innovation. The significant correlation between the two variables ($r = 0.712$, $p < 0.001$) indicates that universities with stronger digital curriculum management, faculty development, practice platform construction, and evaluation management tend to achieve better ethnic music inheritance outcomes. The strong correlation ($r = 0.712$, $p < 0.001$) indicates digital management is not a side-effect of technical assistance but an important tool to improve curriculum development, teaching, practice, and assessment quality of ethnic musical education.

All this follows from studies on digital transformation in higher education. While digital platforms and institutional support can facilitate teaching effectiveness and resource availability, we extend previous results on digital transformation for ethnic music education because of cultural inheritance objectives. While traditional digitalization of music education must be about cultural aspects, oral tradition, performance style, and authenticity, ethnic music digitalization requires cultural context, oral traditions, and performance style. This finding is consistent with Almusaed et al. (2023), who emphasized the role of AI-supported adaptive learning in improving music education quality, and with Wang and Li (2025), who argued that digital transformation in ethnic minority areas depends on both technological platforms and cultural resource integration. However, unlike Baker’s (2021) discussion of Western classical music education, the present study shows that ethnic music education requires stronger attention to cultural authenticity, oral transmission, and local community participation.

The regression results also support the hypothesis that teachers’ dual literacy is a key

mediating condition for coordinated development. Teachers' dual literacy showed the strongest predictive effect ($\beta = 0.328$, $p < 0.001$), suggesting that digital infrastructure alone cannot guarantee successful innovation. This result is in line with Liu, Zhang, and Li (2024), who found that student engagement in ethnic music education is closely related to teachers' instructional design and cultural interpretation ability. Therefore, teachers and inheritors must be able to transform ethnic music knowledge into digital teaching resources while maintaining cultural meaning and performance authenticity.

The qualitative results also give a better picture of the statistical results. Limited resources, low pay, insufficient training, and a lack of cultural awareness all hinder digital transformation. Therefore, the question remains whether universities use digital tools or how to design a management system between digital resources, teacher capacity, practice areas, cultural testing, etc. Overall, joint development relies on technology, management, and cultural awareness.

6. RECOMMENDATIONS

6.1 PRACTICAL IMPLICATIONS

First, universities should create systematic ethnic music digital resources databases that not only store audio and video files but also cultural background, lyrics, scenes, styles, and teaching cases. Second, universities may develop dual-track training of teachers and inheritors. Musicians should be trained in digital education, and ethnic music inheritors need help with recording, editing, online teaching, and digital communication. Third, universities could create virtual-real integrated practice platforms, including offline field learning, digital archives, virtual simulation, and online collaborative teaching. Fourth, evaluations should be managed using multidimensional measurements, such as performance, cultural understanding, participation, creativity, and digital learning records.

6.2 FUTURE RESEARCH

Future work should consider extending the sample to other ethnic minority areas of China to compare different types of music education digitalization. Longitudinal studies are also needed to study how digital transformation affects the ethnic music inheritance under time. Other future research

directions would include ethical issues, cultural authenticity assurance, and AI.

7. CONCLUSION

In this paper, we evaluated the effort of music education management digitalization and ethnic music inheritance innovation in Guangxi universities. This demonstrates that digital transformation in general is still relatively low, and ethnic Music inheritance in particular is moderate. We show a strong relationship between digital management transformation and ethnic M inheritance innovation. Management digitalization is thought to be very important in supporting cultural inheritance in higher music education.

The authors also considered four problem types: fragmented ethnic music digital resources, weak dual literacy of teachers and parents, and the balance between digital application and cultural realism. Their regression analysis indicated that dual literacy, special funding, policy assistance, and characteristic digital resources had a major impact on coordinated development, and teachers' dual literacy was the strongest.

All of our findings have shown that ethnic music inheritance by higher education is not only a cultural motivation, but also digital management. Digital transformation should place resources, teachers, platforms, evaluation, and authenticity protection within a coordinated governance framework.

8. ACKNOWLEDGEMENT

First and foremost, the authors sincerely thank the Guangxi Philosophy and Social Sciences Planning Fund Project (25FMZ007) and the Higher Education Reform Research Project of Guangxi Arts University (2025JGY12) for providing financial and academic support for this study.

The authors also sincerely thank the five surveyed universities for their generous assistance in questionnaire distribution and on-site interviews. The active participation of music teachers, students, administrators, and intangible cultural heritage inheritors provided authentic and valuable data, laying a solid foundation for this empirical research.

As a PhD candidate in Educational Management at Southeast Asia University (Thailand), I would like to express special gratitude to my academic supervisors at the university. Their profound guidance, rigorous academic attitude, and expertise in educational management and cross-cultural research helped me refine the research framework, design

methods, and interpret findings. I also appreciate the constructive comments from academic editors and reviewers.

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