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Guqin Transmission in the Digital Age: A Posthumanist Perspective on Music Education

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Abstract

The transmission of Guqin music, an ancient Chinese cultural tradition, is undergoing profound changes due to digital technology and artificial intelligence. This study examines the intersection of traditional Guqin pedagogy and digital innovation through a posthumanist framework, analyzing how digital tools influence preservation, accessibility, and authenticity. The research in Anhui Province employs ethnographic methods, including interviews with Guqin masters, students, and digital platform developers, to explore the integration of algorithmic learning, virtual performances, and online education. The findings reveal opportunities and challenges: while digital platforms enhance accessibility and engagement, they also disrupt embodied learning practices central to Guqin mastery. This study advocates for a hybrid educational model that merges traditional mentorship with digital augmentation, ensuring cultural sustainability without eroding the Guqin's philosophical and artistic essence. Future research should further investigate the long-term implications of digital mediation in Guqin education and explore its broader cultural significance.

Keywords: Cultural Sustainability, Embodied Learning, Digital Pedagogy, Artificial Intelligence, Posthumanist Education

Introduction

The Guqin, an ancient Chinese seven-stringed zither with a history spanning over three millennia, stands as a profound symbol of cultural, intellectual, and philosophical heritage. Beyond its role as a musical instrument, it embodies a fusion of Confucian, Daoist, and literary traditions, serving as an artifact of aesthetic refinement and spiritual cultivation (Jirajarupat & Yinghua, 2023; Lee, 2023; Tsai, 2016; Yu et al., 2025). Recognized by UNESCO as an Intangible Cultural Heritage in 2003, the Guqin has long been revered for its introspective and meditative qualities, fostering deep connections between performer, instrument, and nature (Hui, 2023; Şahin & Temel, 2022; Zhou, 2022). However, as societies undergo rapid technological and cultural transformations, the traditional mechanisms of Guqin transmission are increasingly challenged. The rise of artificial intelligence (AI), online learning platforms, and digital mediation has profoundly altered the landscape of music education, raising fundamental questions about the preservation of cultural heritage in a posthumanist age.

Posthumanist theory provides a critical framework for examining the interplay between tradition and technological evolution in Guqin transmission. Posthumanism challenges the anthropocentric paradigm of knowledge transmission, recognizing the fluid interdependence between humans, machines, and digital environments in cultural continuity (Braidotti, 2013;

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Dedeoğlu & Zampaki, 2023; Hayles, 1999; Ferrando, 2019). In the context of Guqin education, this shift disrupts conventional master-apprentice pedagogies, introducing algorithmic-driven tutorials, virtual performances, and AI-enhanced learning systems. While these digital interventions democratize access to the Guqin, they also redefine the embodied experience of learning and performance, raising concerns about the loss of affective, sensory, and tacit knowledge intrinsic to traditional oral transmission (Clerkin & Taylor, 2021; Dixon, 2015; Howard, 2016).

Moreover, the hegemony of Western music in formal education further exacerbates the Guqin's marginalization, diminishing its relevance among younger generations (Faure-Carvalho et al., 2022; Tian et al., 2024; Yu et al., 2021). As digitalization reshapes the cultural and educational ecosystem, questions arise about whether the Guqin can retain its epistemic and philosophical essence in technologically mediated learning spaces. Scholars debate whether the integration of AI and digital tools enriches or dilutes the authenticity of musical heritage (Bryan-Kinns & Li, 2020; Longlong & Luen, 2023; Ng et al., 2022). Does the transition to virtual pedagogy allow for cultural sustainability, or does it accelerate a shift towards decontextualized, commodified representations of the Guqin?

This study investigates these complexities by examining the intersection of Guqin transmission and digital technology through a posthumanist lens. Focusing on Anhui Province, a historically significant region for Guqin practice, the research explores the tensions between tradition and innovation, examining how digital technologies influence pedagogy, cultural identity, and artistic agency. It argues for a hybrid educational model that integrates technological advancements with traditional mentorship structures, ensuring that digital tools complement rather than replace embodied knowledge. Ultimately, this research contributes to broader discussions on the role of posthumanism in cultural preservation, advocating for an approach that embraces technological possibilities while safeguarding the Guqin's rich philosophical and artistic legacy (Huang & Yang, 2024; Jirajarupat & Yinghua, 2023; Sharma & Milyartini, 2024).

Literature Review

The Guqin, deeply embedded in Chinese intellectual and philosophical traditions, transcends its function as a musical instrument, symbolizing refinement, scholarly pursuits, and meditative introspection. As a cornerstone of literati culture, the Guqin has historically been associated with Confucian, Daoist, and Buddhist practices, serving as an instrument for self-cultivation and moral education (Zhang, 2023; Zhu & Sornyai, 2024; Zou et al., 2022). However, its transmission has been significantly disrupted by modern societal shifts, particularly digitalization and globalization, which have redefined the ways cultural knowledge is preserved and disseminated (Braidotti, 2013; Ferrando, 2019).

Decline in Traditional Pedagogies

Over the years, the Guqin's presence in mainstream education has diminished, reducing its accessibility to a niche group of enthusiasts. Traditionally, Guqin learning followed an oral, mentorship-based pedagogy emphasizing tacit knowledge, embodied learning, and long-term apprenticeship (Eichman, 2016; Deng, 2020). However, contemporary educational systems, which prioritize standardized curricula and quantifiable outcomes, struggle to accommodate this mode of learning (Hu, 2024; Nissilä et al., 2022). The dominance of Western classical music in formal education further marginalizes traditional Chinese instruments, reinforcing a Eurocentric

framework that overlooks indigenous musical heritage (Faure-Carvallo et al., 2022; Tian et al., 2024; Yu et al., 2021).

This systemic bias has significant cultural and epistemological consequences. It not only weakens intergenerational transmission but also diminishes the Guqin's philosophical and meditative dimensions, which are intrinsic to its pedagogical framework. The loss of direct mentorship affects the development of affective, intuitive, and experiential understanding—elements central to Guqin mastery (Hui, 2023; Şahin & Temel, 2022). Posthumanist scholars argue that such disruptions signal a broader shift toward technologically mediated learning models, where knowledge transmission increasingly relies on algorithmic, digital, and non-human agents (Hayles, 1999; Braidotti, 2013).

Digitalization and Posthumanist Music Pedagogy

Recent scholarship highlights digital technology as a potential bridge between traditional music education and contemporary learning environments. Virtual platforms, AI-driven tutorials, and multimedia resources have emerged as tools for revitalizing the Guqin's transmission, offering global accessibility and adaptive learning methods (Bryan-Kinns & Li, 2020; Longlong & Luen, 2023; Ng et al., 2022). These digital innovations align with posthumanist perspectives, which emphasize the fluid interplay between human cognition and machine intelligence in knowledge production (Ferrando, 2019; Hayles, 1999).

However, this shift raises critical questions about cultural authenticity, embodied musicianship, and the impact of algorithmic mediation on artistic expression. Scholars debate whether AI-generated Guqin tutorials enhance learning or create a disembodied, mechanized approach that strips the instrument of its aesthetic and philosophical depth (Clerkin & Taylor, 2021; Dixon, 2015; Howard, 2016). Posthumanist critiques suggest that while digital augmentation extends the reach of cultural heritage, it also transforms the ontological status of music, reconfiguring the relationship between performer, instrument, and audience (Braidotti, 2019; Hayles, 2017).

Bridging Tradition and Innovation

Existing studies have laid an important foundation for understanding the cultural and educational value of the Guqin. However, many fail to address practical strategies for integrating technological advancements without undermining traditional pedagogical frameworks (Huang & Yang, 2024; Jirajarupat & Yinghua, 2023; Sharma & Milyartini, 2024). This study seeks to fill this gap by advocating for a hybrid learning model—one that preserves the Guqin's embodied, mentor-driven pedagogy while utilizing digital tools to enhance accessibility and engagement.

Ultimately, the intersection of Guqin transmission and digital technology represents a crucial case study in posthumanist cultural preservation. It underscores the need for an ethically grounded approach to technological adaptation—one that balances innovation with respect for historical knowledge systems and intangible cultural heritage (Howard, 2016; Deng, 2020).

Materials and Methods

Research Design

This study employs a qualitative ethnographic approach to examine the transmission of Guqin music in the digital age, framed within posthumanist discourse. Ethnographic methodologies provide a lens to explore the evolving relationships between human musicians, digital

technologies, and artificial intelligence (AI) in cultural preservation (Bonini & Gandini, 2020; Miksza et al., 2023). As posthumanism redefines the interplay between human agency and non-human actors, this study critically interrogates how digital technologies reshape traditional knowledge systems in music education (Braidotti, 2019; Ferrando, 2019).

By immersing in lived experiences, this research investigates the hybridization of traditional oral mentorship with algorithmic mediation, examining whether AI-driven pedagogies enhance or disrupt Guqin learning. The ethnographic approach allows for a situated analysis of music education as an entangled process involving embodied cognition, machine learning algorithms, and digital pedagogy (Hayles, 2017).

Research Site and Participants

This study was conducted in Anhui Province, a historically significant region for Guqin heritage, where traditional teacher-disciple pedagogies coexist with emerging digital platforms. A purposive sampling method was used to select 15 participants, ensuring diverse perspectives across traditional and digital learning environments. The participant pool included:

- **Guqin Masters:** Custodians of oral tradition, emphasizing embodied learning.
- **Educators:** Integrating Guqin into contemporary music curricula.
- **Students and Enthusiasts:** Engaging with both in-person and digital learning modalities.
- **Digital Platform Developers:** Innovators designing AI-driven Guqin tutorials and virtual performance spaces.

This selection facilitates a multifaceted analysis, enabling a comparison between pre-digital and post-digital approaches to Guqin transmission.

Data Collection Methods

A multi-modal data collection strategy was employed, integrating traditional ethnographic techniques with digital ethnography. Table 1 outlines the data sources and methodological rationale:

Tool/Source	Description	Justification
Semi-structured interviews	Conducted with Guqin masters, students, and digital developed	Allowed for exploration of hybrid transmission models
Video recordings	Documented live performances, online tutorials, and AI-generated music simulations	Provided comparative data on technique and expressivity
Digital ethnography	Examined virtual Guqin communities, AI-assisted tutorials, and online discussion forums	Explored the posthumanist shift in knowledge dissemination
Archival research	Analyzed historical Guqin scores, written pedagogical treatises, and contemporary digital learning resources	Contextualized traditional and modern instructional methods

Table 1. Tools and data sources

This methodological integration ensures a nuanced understanding of how Guqin transmission adapts in digital environments while preserving its cultural integrity.

Data Analysis

The study employs a thematic analysis framework, applying critical posthumanist theory to identify key themes across traditional and digital pedagogical contexts. Data analysis involved:

1. **Transcription and Coding:** Interviews and digital discussions were transcribed and coded using NVivo software to categorize emergent patterns.
2. **Theme Development:** Recurring themes were identified, particularly regarding the cultural embodiment of the Guqin, tensions in digital transmission, and AI-enhanced learning paradigms.
3. **Triangulation:** Findings were cross-validated through participant observations, interviews, and online learning case studies.

The identified themes are summarized in Table 2:

Theme	Focus
Cultural Embodiment	Examines the role of physical technique, emotion, and intuition in Guqin learning
Technological Mediation	Investigates how AI and digital tools augment or disrupt traditional music pedagogy
Hybrid Learning Models	Explores integrative frameworks that balance human mentorship and digital augmentation

Table 2. Overview of data collection methods

Posthumanist Implications

This methodological approach highlights the posthuman transformation of Guqin transmission, illustrating how non-human agents (AI, digital archives, algorithmic composition tools) interact with human cognition and pedagogy (Braidotti, 2019; Hayles, 2017). It underscores how Guqin education, once reliant on embodied oral traditions, is reconfiguring through algorithmic mediation, prompting critical ethical and philosophical questions about digitalization's role in preserving.

Results

The findings of this ethnographic study reveal a nuanced understanding of Guqin transmission in the digital age, illuminated through a posthumanist analytical framework. The data gathered from Anhui Province suggest a complex interplay between traditional embodied pedagogical practices, digital media interventions, and non-human actors (such as artificial intelligence algorithms and virtual learning platforms). Three key themes emerged from the research analysis: (1) the enduring cultural significance of the Guqin, (2) the challenges posed by digitalization to traditional, embodied modes of transmission, and (3) the transformative yet ambivalent potential of digital media for the preservation and education of Guqin music.

Cultural Embodiment and Musical Significance of the Guqin

The Guqin (Figure 1), characterized by its minimalist design and tonal depth, remains not merely a musical instrument but an integral cultural artifact deeply embedded in Chinese intellectual and philosophical traditions. Interviews with practitioners emphasized the Guqin's role as a pedagogical and spiritual apparatus, embodying Daoist notions of harmony with nature and Confucian ideals of personal refinement. Participants consistently described the Guqin as a living entity whose identity emerges through embodied interactions between musician, instrument, and environmental surroundings. This conceptualization aligns with posthumanist understandings of distributed agency, in which music education becomes an entangled process involving humans and non-humans.



Figure 1. Chinese Guqin

Source: What are the benefits of learning Guqin, 2022

The Guqin's traditional tuning system (illustrated in Figure 2) underscores its modal complexity, foundational for its philosophical and emotional resonance. Participants emphasized that mastery of these tonal structures required deeply embodied forms of learning, including tactile sensitivity, sensory memory, and embodied cognition—elements challenging to replicate purely through digital tools.

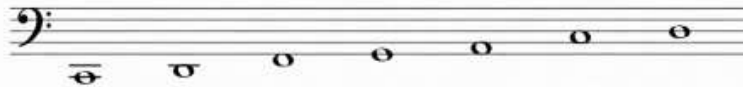


Figure 2. The pitch of the seven strings

Challenges of Technological Mediation

The study identified significant tensions arising from the intersection of digital technologies and embodied Guqin pedagogy. While digital media, particularly AI-driven platforms, virtual tutorials, and virtual reality simulations, significantly enhance the accessibility and dissemination of Guqin music, they simultaneously introduce critical disruptions to traditional transmission methods. Figures 3 through 9, capturing Bingyan Yao's performance of "Wu Ye Ti," demonstrate highly sophisticated Guqin techniques that practitioners unanimously emphasized as demanding direct mentorship and tactile immersion.



Figure 3. Bingyan Yao's performance score 1

For instance, rhythmic contrast techniques illustrated in Figure 3 serve as critical tools for teaching expressive and nuanced musical interpretations. Similarly, Figure 4 depicts upward ("Chuo") and downward ("Zhu") glissandos, revealing the intimate relationship between physical technique and expressive emotional narratives. These nuances, practitioners argued, are difficult to fully capture in algorithmically generated tutorials and videos, where subtle physical dynamics and sensory embodiment might be inadequately represented.



Figure 4. Bingyan Yao's performance score 2

Additionally, Figure 5 represents unresolved melodic phrasings central to the Guqin's introspective quality, demonstrating the importance of mentorship for teaching these philosophical dimensions. The embodied nature of these techniques often defies algorithmic standardization, posing substantial pedagogical challenges in digital environments.



Figure 5. Bingyan Yao's performance score 3

Moreover, traditional teaching techniques, such as the "Suo Ling" repeated plucking and "Big Crab Walking Posture" technique depicted in Figure 6, require personalized and sustained interaction between mentor and learner. Participants expressed concerns that solely digital pedagogical approaches could oversimplify or misrepresent these deeply embodied skills, potentially undermining the affective and philosophical essence of the Guqin.



Figure 6. Bingyan Yao's performance score 4

Ambivalent Transformations through Digital Media

Despite the acknowledged challenges, the study found that digital platforms provide unprecedented opportunities for revitalizing Guqin education. Digital media's transformative potential emerged through three distinct dimensions: increased global accessibility, archival preservation, and generational engagement.

Online platforms such as virtual tutorials and interactive digital content, as exemplified online performance of "Wu Ye Ti" in Figure 7, transcend geographical and cultural limitations. Participants described how these resources allow students worldwide to engage with Guqin practices previously constrained to localized, face-to-face contexts.



Figure 7. The Guqin music piece “Wu Ye Ti” performed
<https://www.youtube.com/watch?v=cM7vImm9Ri0>

Further, digital archives provide substantial contributions to the safeguarding of Guqin scores, techniques, and historical records. Figures 8, 9, and 10 exemplify detailed digital documentation, presenting intricate performance practices accessible beyond traditional master-apprentice contexts.



Figure 8. Bingyan Yao’s performance score 5

Figure 8 illustrates how rhythmic experimentation, and dynamic articulation can engage students more attuned to modern musical aesthetics, fostering connections between traditional Guqin music and contemporary listening preferences.

Participants notably emphasized the pedagogical value of digitally documenting expressive and technically challenging passages, such as those depicted in Figures 9 and 10, from the climax of the piece “Wu Ye Ti.” The rapid tempos and dynamic complexity illustrated in these excerpts were identified as particularly challenging to teach through conventional methods alone, suggesting that audiovisual recordings on digital platforms offer supplementary means of capturing and conveying nuanced interpretations.



Figure 9. Bingyan Yao’s performance score 6



Figure 10. Bingyan Yao's performance score 7

Developing a Hybrid Model: Integrating Embodied and Digital Pedagogies

Given the complexities identified, the participants advocated strongly for adopting a hybrid approach to Guqin education—combining traditional mentorship and embodied pedagogy with digital and AI-supported tools. This integrative model was further clarified through thematic categories identified in the qualitative analysis (Table 3):

Theme	Description
Cultural Embodiment	Examines how physical technique, emotional expression, and philosophical insights contribute to Guqin mastery
Technological Mediation	Explores benefits and pitfalls of digital media in transmitting embodied musical knowledge
Hybrid Learning Models	Identifies strategies to combine traditional mentorship with digital and algorithmic learning tools

Table 3. Overview of emergent themes from the study

Participants underscored the importance of policy-level interventions advocating for balanced representation in music curricula, explicitly recommending the integration of traditional Chinese instruments within contemporary educational frameworks. They suggested that such integrative approaches would prevent marginalization and preserve the Guqin's cultural depth within an increasingly posthuman educational context.

Ultimately, findings reveal that successfully navigating Guqin transmission in a digitally mediated context necessitates careful balance. Digital technologies hold substantial promise for revitalizing interest and participation among younger generations yet require mindful implementation to retain the instrument's profound philosophical and embodied knowledge. The proposed hybrid pedagogical framework, combining technological innovation with traditional human mentorship, emerged as the most viable strategy for maintaining the Guqin's cultural vitality and educational relevance within contemporary posthumanist landscapes.

Discussion

The cultural and philosophical depth of the Guqin remains clear, aligning with previous research highlighting its value in facilitating introspection and intellectual refinement (Hui, 2023; Lee, posthumanism.co.uk)

2023). However, the posthumanist perspective adopted here extends this understanding by foregrounding the fluid boundary between human performers and technological mediators. In line with posthumanist theory (Braidotti, 2019; Ferrando, 2019), digital platforms and artificial intelligence emerge not merely as supplementary tools, but as active agents co-constructing musical knowledge and practices.

The observed challenges, including generational disengagement and marginalization within formal music education, mirror broader posthumanist critiques regarding anthropocentric biases and hierarchical knowledge structures (Braidotti, 2013). As traditional mentor-driven, embodied pedagogies confront the widespread adoption of digital platforms, a critical tension arises between preserving cultural authenticity and embracing technologically mediated practices. This aligns with earlier concerns raised by scholars (Du & Leung, 2022; Faure-Carvallo et al., 2022) about the risk of decontextualizing traditional musical forms through oversimplified digital representations.

However, findings also reveal significant opportunities inherent in digital mediation. Specifically, virtual tutorials, AI-assisted learning, and digital archives demonstrate their capacity not only to democratize access but also to recontextualize Guqin pedagogy within contemporary educational paradigms (Bryan-Kinns & Li, 2020; Ng et al., 2022). This suggests that, within a posthumanist framework, digital platforms can effectively supplement and enhance embodied musical learning without necessarily undermining its epistemological foundations.

Echoing constructivist learning theories that advocate for experiential and contextualized approaches (Huang et al., 2024), this study supports integrating digital tools into traditional mentorship practices, thereby establishing a hybrid pedagogical model. Such an approach resonates with Braidotti's (2019) argument for collaborative interactions between human and non-human agents in knowledge production. By doing so, the study contributes to ongoing posthumanist dialogues on cultural preservation, sustainability, and education, underscoring the need for adaptive yet culturally sensitive implementations of technology (Howard, 2016; Deng, 2020).

Conclusion

A balanced approach to Guqin transmission is essential to ensure that technological advancements complement rather than replace traditional pedagogies. The integration of digital tools must respect the philosophical and artistic essence of the Guqin while fostering innovation in music education. This requires collaboration among educators, cultural institutions, and policymakers to develop hybrid learning models that retain the authenticity of oral traditions while utilizing digital platforms to reach new audiences. Systemic reforms in education policies should also encourage the inclusion of traditional Chinese instruments alongside contemporary digital resources.

Future research should examine the impact of digital interventions across different cultural and regional contexts, exploring how localized practices adapt to technological shifts. Comparative studies can provide insights into the varying effectiveness of digital learning models, while longitudinal research can assess the sustainability of digital tools in maintaining cultural authenticity. Further exploration of emerging technologies, such as augmented and virtual reality, may also present new possibilities for enhancing the Guqin learning experience.

By embracing a posthumanist framework, this study underscores the evolving relationship

between human musicians, non-human agents, and digital technologies. The future of Guqin transmission lies in a flexible, ethically grounded approach that merges tradition with technological possibilities, ensuring its continued relevance and cultural vitality in an increasingly digitalized world.

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