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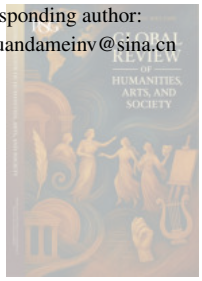
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A Modeling Framework and Qualitative Evaluation Pathway for Multimodal Knowledge Graphs Empowering the Inheritance of Tibetan–Qiang–Yi Intangible Cultural Heritage Dance

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Abstract

Tibetan–Qiang–Yi intangible cultural heritage dances convey rich cultural meanings through embodied movement, rhythm, costumes, and ritual settings. However, short-video dissemination often leads to decontextualization, fragmentation, and superficial learning, which weakens the inheritance of dance traditions. To address the difficulty of representing processual dance knowledge with a single medium, this paper proposes a multimodal knowledge graph framework for Tibetan–Qiang–Yi ICH dance. Using "movement–context unit" as the basic granularity, we construct temporal, spatial, and dynamic relational structures, and apply an evidence-chain mechanism to link multimodal materials with assertion nodes, thus preserving lineage variants and polyvocal interpretations. Pedagogical translation, which converts dance analytic language into executable training narratives, is integrated to support practical teaching. Furthermore, we design a qualitative evaluation pathway that operationalizes teachability, transmissibility, explainability, and correctability into observable indicators and assessment outputs. This framework provides a feasible approach for classroom training, community co-maintenance, and communication governance of ICH dance inheritance.

Keywords: multimodal knowledge graph; Tibetan–Qiang–Yi; ICH dance; modeling framework; pedagogical translation; evidence chain; qualitative evaluation pathway

1. Introduction

Explanations for the inheritance crisis of dance-related ICH often emphasize "population mobility" or "shifts in interest." From within dance studies, however, rupture more frequently occurs when the conditions that make a dance intelligible and viable are weakened. ICH dance is not a mere stack of movements. Rather, it constitutes a dance grammar recognizable to a community, jointly formed by temporal structures (e.g., drum patterns, sung-response cadences, cues, and breathing), spatial structures (e.g., formations, pathways, orientations, and boundaries), and dynamic structures (e.g., trajectories of the center of gravity, pathways of force, and distributions of tension and release). Many Tibetan–Qiang–Yi dances unfold within festival or ritual processes: openings, transitions, and closures are often triggered by lead-dancer cues and rhythmic signals; opening/closing of formations, circling, and facing patterns are frequently entangled with role order and viewing boundaries. When such conditions are trimmed away in digital circulation, dance is reduced to "good-looking movements," rather than practical knowledge that is enterable, correctable, and teachable.

At the level of safeguarding principles, UNESCO's 2003 Convention for the Safeguarding of the Intangible Cultural Heritage defines safeguarding not as archiving alone but as an integrated set of measures—identification, documentation, research, preservation, protection, promotion, enhancement, and transmission—grounded in respect for the relevant communities, groups, and individuals. This implies that digitalization confined to audiovisual archiving or platform distribution is insufficient for the goal of "inheritance." For dance, the critical

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issue is not whether videos exist, but whether a teachable and learnable organization of knowledge is formed—so that movements can be reconnected to rhythm and space, explanations can be reconnected to setting and lineage, and differences can be articulated rather than flattened. Pedagogical translation refers to the core conversion process of translating professional dance movement-analysis terminology into clear, operable classroom training narratives, which stabilizes effective teaching cues, targeted correction language, and unified stylistic judgment standards for ICH dance inheritance teaching.

Multimodal knowledge graphs offer a promising mode of organization: they bind structured relations to multimodal evidence, so that movement segments, audio beats, oral explanations, setting photographs, and costumes/objects do not sit side-by-side as an undifferentiated heap but support one another within a shared semantic structure. Existing cultural-heritage graph practices, however, often take registry entries as units and tend toward macro-level aggregation; processual dance knowledge—movement segmentation, rhythm alignment, spatial syntax, and dynamic cues—remains comparatively underdeveloped. Accordingly, rather than adding more technical indicators, this paper centers movement analysis and pedagogical translation from dance studies in the modeling process and proposes a non-quantitative qualitative evaluation pathway, providing observable and reviewable handles for discussing how knowledge graphs can empower inheritance.

To sharpen the problem focus, we address three research questions: (1) RQ1: Within the temporal–spatial–dynamic organization of Tibetan–Qiang–Yi ICH dance, what granularity can both retain phrase-level logic and enter classroom training and correction? (2) RQ2: How can a graph accommodate contextual boundaries, lineage differences, and polyvocal interpretations simultaneously so that "difference" can be explained rather than flattened? (3) RQ3: Without presupposing quantitative statistics, how can teachability, transmissibility, explainability, and correctability in the inheritance process be operationalized into an observable, reviewable, and comparable evaluation pathway?

The contributions are twofold. First, we propose a multimodal knowledge-graph modeling framework for processual dance knowledge, integrating movement syntax, rhythmic alignment, spatial syntax, and dynamic texture into a unified set of structured relations, while an evidence-chain mechanism counteracts the tendency toward a single version or a single interpretation. Second, we present a qualitative evaluation pathway aligned with the framework, generating assessment outputs via an observable and reviewable recording format, providing back-linkable grounds for teaching, community maintenance, and communication governance. The paper does not aim to estimate effect sizes in the statistical sense; instead, it examines whether a modeling–evaluation–correction loop can be established and how transferable this loop is across settings.

2. Theory and Related Work

Dance studies and anthropology share a methodological premise: the meaning of dance is not self-evident; it is generated through the relationship between action and context. Geertz's notion of "thick description" argues that cultural analysis should understand behavior within webs of meaning rather than treat behavior as context-free facts (Geertz, 1973). In dance research, thick description is not simply adding background paragraphs; it means returning movements to their conditions of possibility—why one must "sink" on a particular drum pattern, why a formation opening/closing occurs only at a specific temporal node, and why certain actions are performed only by particular identities. Removed from these conditions, movement descriptions are easily misread in circulation as mere stylistic elements.

The layer of embodied knowledge is equally critical. In discussing practice and habitus, Bourdieu notes that much knowledge is not an explicit rule but an embodied logic of perception and action, formed through participation, correction, and repetition (Bourdieu, 1977). Dance ICH is especially difficult to carry in any single medium: trajectories of the center of gravity, breath coordination, internal beats, formation collaboration, and pathways of force are rarely communicable in a one-shot explanation. Having video does not automatically yield learnability, because learners may cycle at the level of surface imitation while never grasping the internal logic of "why movements are organized this way." This gap can be effectively bridged by pedagogical translation, which transforms implicit embodied logic into explicit training language.

Performance studies further remind us that tradition is not static; repetition always entails reinterpretation. Turner's analysis of ritual process and communitas helps explain why dance segments are bound to particular temporal phases and orders (Turner, 1969). Schechner's concept of "restored behavior" clarifies that performance practices are repeatable yet transformable, offering a framework for the legitimacy of variants in ICH dance (Schechner, 2002). Dance-anthropological syntheses likewise emphasize that dance, as a cultural form, generates structure through the organization of bodies in time and space and interweaves with music, social relations, and symbol systems (Kaeppler, 1978). Together, these studies suggest that dance knowledge is inherently multimodal, relational, and contestable. Any digital organization aimed at "one version, one interpretation" risks ossifying a living tradition.

Within dance studies, traditions of movement analysis provide methodological resources for translating experiential transmission into languages that are describable, discussable, and teachable. Adshead's hierarchical approach—from elements and structure to interpretation—treats dance not only as an object of viewing but as an analyzable movement structure (Adshead, 1988). Complementarily, Laban and Lawrence's Effort framework offers a vocabulary for dynamic texture (combinations of weight, time, space, and flow), rendering judgments of "does it look right" into operational dimensions (Laban & Lawrence, 1974). These tools are not meant to force ICH dance into external paradigms; rather, they support a maintainable descriptive language for transmission in digital environments, enabling movement, rhythm, space, and dynamics to be coordinated within a shared knowledge structure.

On the technical side, multimodal knowledge-graph research emphasizes cross-modal alignment, consistent granularity, and binding to evidence (Liang et al., 2024). Multimodal graph practices in cultural heritage demonstrate the feasibility of multi-source integration, but processual dance knowledge still requires stronger organization of "movement–rhythm–space–dynamics" (Fan et al., 2023).

3. Research Design and Data Sources

This study adopts a qualitative research pathway centered on field materials and classroom trial teaching, emphasizing observable and reviewable process evidence rather than substituting training logic with statistical quantities.

(1) Sources and organization. Materials include dance-segment videos and on-site recordings, oral explanations and terminological notes, photographs of settings and formations, and records of costumes/objects and accompaniment. All materials are indexed using segment timecodes to enable back-linking to concrete evidence within the graph.

(2) Participation and annotation roles. Building on explanatory frameworks provided by community inheritors/lead dancers, we integrate instructors' training cues, corrective utterances, and learners' common error logs to form three types of texts—"explanation–training–error"—each attached in the graph to its speaker, occasion, and boundary of applicability.

(3) Analytic and modeling workflow. (i) Segment a dance phrase into movement units, with boundaries jointly determined by rhythmic, spatial, and dynamic signals; (ii) for each movement unit, write a

paired context unit (phrase function, role order, taboo boundaries, and setting constraints); (iii) encode rhythmic alignment, formation pathways, and dynamic texture as a triple structure of relations; (iv) establish evidence chains and version records for oral explanations, making differences traceable and discussable.

(4) Ethics and authorization. For community-internal knowledge, ritual taboos, and segments unsuitable for public release, we adopt a strategy of "tiered visibility + authorization binding": public display and internal transmission are assigned different access ranges, while attribution, authorization, and versioning are fixed as graph metadata.

4. Research Framework

To ensure deployability, we propose a minimal viable schema for organizing knowledge, binding multimodal evidence to dance grammar.

4.1. Movement Units

In dance pedagogy, scale imbalance is a recurring difficulty: treating an entire dance as a unit offers no entry point for learners, while decomposing into isolated poses erases phrase logic. We therefore adopt the "movement unit" as the key granularity. It is not a simple time slice but a trainable short-phrase structure with clear boundaries that can stably function within classroom cues, corrective language, and repetitive practice.

Boundaries are typically co-determined by three signals. First, rhythmic signals (drum patterns, phrase endings in sung response, and lead-dancer cue landings) determine where actions land on-beat and where they extend across beats. Second, spatial signals (formation opening/closing points, turning points, and pathway inflections) determine where orientations shift or group alignment is completed. Third, dynamic signals (center-of-gravity landings, force peaks, and breath-change points) determine how force gathers and disperses and how rhythmic tension is distributed. Only when these signals cohere does a movement unit become a genuinely teachable and learnable unit.

A minimal description set for a movement unit includes four clusters of dance-analytic elements: (1) bodily organization (supporting foot and CoG trajectory, trunk-led vs. limb-led initiation, joint opening/closing sequence); (2) dynamic texture (combinations of sink/lift, tension/relaxation, straight/curved, bound/free); (3) temporal structure (on-beat stepping, syncopation, suspension, anticipation, and response); (4) spatial composition (high/middle/low levels, near-body vs. extended reach, orientation and pathway). Dynamic texture is often the decisive line between "right" and "not quite right," and it is the dimension most difficult for video to convey yet most necessary to verbalize (Laban & Lawrence, 1974).

4.2. Context Units

In this paper, context is not an auxiliary background appendix; it is an external constraint on movement structure. For dance ICH, context first manifests as setting boundaries and role order: distinctions between sacred and public zones, between viewing and participation areas; relations among lead dancers, ensemble dancers, accompanists, and responders; and normative sequences and taboo boundaries. Context also manifests as phrase function and narrative cues: why a segment performs greeting/farewell, blessing, response, or transition; and why certain formation openings/closings must occur at specific nodes. Encoding context into structure answers the methodological demand of thick description (Geertz, 1973) and aligns with ICH safeguarding's emphasis on transmission and respect for communities.

4.3. Relational Organization of the Triple Structure

Digital circulation distorts dance knowledge less because movements are poorly recorded than because the triple structure on which movements depend is disassembled: temporal structure, spatial structure, and dynamic structure. Traditional transmission continuously places learners under these constraints through cues, demonstration, and correction; once the constraints are severed, learning readily slips into "surface-form copying."

At the temporal level, the movement–rhythm relation should be understood as an organization of force in time, not merely "hitting points." With the same meter and step type, whether the CoG sinks on the beat or lifts before it, whether an action drops straight down or suspends across beats, and whether group landings are hard-aligned or layered in leader–follower timing directly shape dance texture. The value of a dynamic-texture vocabulary lies precisely in translating experiential judgments of "heavy, slow, bound" into discussable descriptions so that pathways of force enter the knowledge structure (Laban & Lawrence, 1974).

At the spatial level, movement and formation should be understood as a spatial syntax of collective coordination. Circularity, facing patterns, interleaving, circling, and return pathways often embody cooperation relations and boundary orders within the community. When openings/closings occur, when pathways fold back, and when orientations unify or differentiate often mirror the advancement of ritual process (Turner, 1969). If only stage-like shots remain without spatial-syntax description, movements are misread as arbitrary blocking; more seriously, direction-sensitive segments may be misused in inappropriate contexts. Writing orientation, pathways, inner/outer circle positions, and relative relations to the lead dancer into movement units effectively inscribes "how group dance becomes communitas" into structure.

At the dynamic/semantic level, movement and interpretation cannot be treated as static labels. Field experience indicates that the same movement may carry different interpretations across villages or lineages, with differences often rooted in setting function or historical change (Geertz, 1973; Kaeppler, 1978). If a graph retains only one interpretation, difference is technologically flattened and may even crystallize a new "standard version." We therefore place interpretations in a contestable chain: each interpretation is bound to its proponent, occasion, lineage position, and setting function, enabling differences to be explained as "why they differ" rather than compressed into "who is right" (Schechner, 2002).

Evidence Chain Technical Implementation: The evidence-chain mechanism is technically implemented via property graph with provenance metadata and RDF reification. Each interpretation node is attached with provenance attributes (proponent, lineage, occasion, setting) as edge properties; named graphs are used to store variant interpretations from different lineages, and each assertion node is back-linked to multimodal evidence (video timecodes, audio clips, oral transcripts) via unique identifiers. This realizes traceable polyvocal interpretation storage without flattening lineage differences.

Moreover, dance dynamics are often co-produced through body–object and body–sound relations. Object weight alters force pathways; ornament sounds participate in rhythmic experience; costume structures affect swing amplitude and line direction. If these factors are treated merely as "decorative information," distortion arises at the most critical stylistic layer. Linking movement units to objects, costumes, and sound materials through evidence connections allows the "conditions under which movement holds" to be preserved and transmitted alongside the movement itself.

4.4. Pedagogical Translation

Whether a knowledge graph can serve inheritance hinges not on how much material it stores but on whether it can organize materials

Table 1. Node and Relation Schema

Category	Node/Relation	Description	Key Fields
Node	Movement unit	A trainable short-phrase structure with clear start–end boundaries	timecode; beat points; CoG/pathway hints
Node	Context unit	Structured description of phrase function, role order, and taboo boundaries	setting; roles; taboos; applicability boundaries
Node	Rhythmic pattern sung-response cadence	Evidence for temporal structure such as drum patterns and phrase endings	beat annotation; cadence markers
Node	Spatial structure	Formations, orientations, pathways, and boundary positions	formation diagram; orientation; turning points
Node	Dynamic texture	Stylistic cues such as sink–lift ratio, tension distribution, and force peaks	CoG landing points; tension; release/containment
Node	Interpretation & evidence	Oral explanations, terms, corrective utterances, and their evidence links	proponent; occasion; lineage; version
Relation	Alignment / constraint / variant	Couplings between movement and rhythm/space/dynamics, and lineage variants	alignment rules; variant conditions; dispute status

into executable training pathways for the classroom. Pedagogical translation is defined as the process of converting professional dance movement-analytic language into clear, executable classroom training narratives, which stabilizes effective teaching cues, targeted correction language, and unified stylistic judgment criteria for ICH dance teaching and learning. The core is not to "explain movements more finely," but to stabilize the cues that actually work in training. A practical sequence is: first establish the temporal skeleton through cues and counting; then establish the dynamic skeleton through breath and CoG trajectories; next establish the spatial skeleton through orientation and pathways; finally stabilize stylistic judgment through corrective language. Hierarchical movement analysis provides a fulcrum for such translation, enabling description to move beyond element listing toward coherent narratives that connect short-phrase structure and phrase function (Adshead, 1988).

5. Qualitative Evaluation Pathway

This paper does not conduct quantitative statistics, but evaluation must be observable, reviewable, and actionable for dance training and communication governance. The "assessment outputs" proposed here should at minimum address whether movement structure is teachable, whether stylistic texture is transmissible, whether contextual boundaries are respected, whether lineage differences are explainable, and whether circulated content is back-linkable and correctable. On this basis, we propose the following qualitative evaluation dimensions. To prevent the dimensions from remaining at the conceptual level, we operationalize each into a three-part record of "observational indicators–documentary materials–assessment outputs."

5.1. Contextual Thickness

Contextual thickness is not measured by the amount of material but by whether it explains why movement syntax is organized as it is. Evaluation focuses on whether phrase function is clear, how the function is realized through rhythmic and formation organization, and whether boundaries and taboos are explicitly stated. The goal of thick description is to enable understanding of "why the dance is danced this way," not merely "how it is danced" (Geertz, 1973).

5.2. Structural Consistency and Stylistic Consistency

In dance studies, being "correct" does not equal uniform neatness. For ICH dance, structure and style should be distinguished. Structural consistency concerns whether short-phrase structure holds: whether openings, transitions, and closures occur at appropriate positions; whether collective landings complete on key beats; and whether formation opening/closing initiates at proper nodes. Stylistic consistency concerns whether dynamic texture holds: whether sink–lift ratio, tempo handling, straight/curved trajectories, and bound/free control align with the training tradition of a dance or lineage.

Illustrative Example: Take a Qiang sheepskin drum dance phrase as an example—structurally, the learner correctly completes the 8-beat movement sequence, formation opening at beat 4 and closing at beat 8 (structural consistency holds); but stylistically, the required "heavy sink on drum beats, steady bound flow" is replaced by "light lift, loose free flow" (stylistic consistency deviates). A dynamic-texture vocabulary supports descriptive evaluation. For instance, if a segment should present as "heavy and slow, spatially straighter, with more bound flow," but is realized as "light and fast, spatially floating, with overly free flow," then style can be judged as not established (Laban & Lawrence, 1974).

5.3. Rhythmic Interlock

Rhythmic interlock can be assessed rigorously through classroom observation: whether CoG landings complete on key beats of a drum pattern; whether cross-beat suspension matches sung-response cadence endings; and whether group landings are triggered by lead-dancer cues and completed on the same beat. This dimension distinguishes "looking roughly similar" from genuine rhythmic coupling, and is particularly suitable for collective dance phrases.

5.4. Spatial Syntax and Formation Coordination

Formations are not decorative pictures but often embody collective structure. Evaluation focuses on three spatial nodes: whether openings/closings occur in the correct phrase positions and correspond to affective/ritual progression; whether turning is trunk-led rather than achieved by toe-pivot shortcuts; and whether response relations hold in spatial counterpoint (e.g., clear resonance between inner/outer circles or facing lines). This dimension moves space from "looks good" to "structure holds."

Table 2. Qualitative Evaluation Dimensions

Dimension	Observational Indicators	Documentary Materials	Assessment Outputs
Contextual thickness	Whether phrase function, role order, and taboo boundaries can be articulated; whether it answers "why organized this way"	context cards; excerpts of oral explanations; corresponding evidence timecodes	Context explanation complete/partial/missing; Boundary items to be supplemented
Structural consistency & stylistic consistency	Whether opening–transition–closure sequence holds; whether sink–lift ratio and release/containment align with lineage	movement-unit descriptions; classroom video; style-comparison notes	Structure holds/has break points; Style holds/has deviation items
Rhythmic interlock	Whether CoG landings complete on key beats; whether cross-beat suspension matches sung-response cadence endings	beat-annotation screenshots; cue logs; timecode alignment sheet	Rhythm interlocked/superficially aligned; Beat points to be corrected
Spatial syntax & formation coordination	Whether spatial nodes for opening/closing, turning, and response are clear; whether orientation/pathways are misread	formation sketches; setting photos; turning-point annotations	Spatial syntax holds/has axis-loss locations; Spatial constraints to be added
Accessibility of learning pathways	Learners can reproduce movement sequence after cue-based instruction; learners can self-correct based on sink–lift ratio feedback; instructors can locate error sources to specific movement–rhythm–space–dynamic layers	trial-teaching logs; error typology table; excerpts of corrective utterances	Error–correction–node update loop closed/not closed; Learning barriers to be optimized
Community agency & communication controllability	Whether attribution and authorization are clear; whether public content can back-link evidence and source explanations	authorization records; version logs; samples of external dissemination	Recommended access tier determined; Disputes traceable/untraceable

5.5. Accessibility of Learning Pathways

Accessibility is not measured by pass rates but by whether sticking points can be located and fed back into modeling. Evidence comes from process records in trial teaching or rehearsal observation: whether learners can enter the temporal skeleton via cues and counting; stabilize sink–lift ratio via CoG trajectories and breathing prompts; complete collective landings and responses via formation coordination; and understand phrase function and boundaries via contextual explanation. Teachability here derives from structural organization rather than resource accumulation.

5.6. Community Agency and Communication Controllability

Community agency is an ethical baseline: whether the community can participate in adding oral accounts, naming corrections, annotating lineage differences, and setting public boundaries, and whether attribution and authorization are clear. Communication controllability emphasizes correctability: whether external content can be back-linked to evidence nodes and whether disputes can be located to assertion sources and updated with revised explanations. These principles align with the Convention's safeguarding orientation emphasizing respect for communities and transmission-oriented measures (UNESCO, 2003/2024).

6. Pathways for Dissemination and Governance

In the context of dance ICH, dissemination is not mere diffusion; it concerns whether the conditions for intelligibility and teachability are retained when dance is placed into different social settings. Dissemination without governance can slip into decontextualized consumption; governance without scenario-specific arrangements can devolve into empty principles. We therefore discuss dissemination and governance together across four settings: education, community, cultural tourism, and cross-cultural communication.

In educational settings, the graph should function as a curriculum structure rather than a resource repository. Movement units provide entry granularity; rhythmic alignment provides the temporal skeleton; spatial syntax provides the skeleton of collective coordination; and context units provide meaning and boundaries. Crucially, pedagogical translation should stabilize training cues into reusable narratives: cues and counting; breathing and CoG trajectories; orientation and pathways; corrective language and stylistic judgment. Such organization moves learning from "following along" to "entering dance grammar," consistent with hierarchical pathways in dance analysis (Adshead, 1988).

In community settings, the graph acts as a collaborative device of collective memory. Sustainability depends less on one-time collection than on institutionalized maintenance: after festivals, supplement oral accounts and validate phrase segments; during training, record common errors and corrective utterances; in inter-village exchanges, juxtapose variants and explain lineage reasons. Tiered visibility is essential: what may be publicly displayed, what is suitable only for internal transmission, and what should not be shared externally. Encoding public boundaries into context units and binding them to authorization and attribution operationalizes "respect for communities" as an executable mechanism (UNESCO, 2003/2024).

In cultural-tourism settings, the graph functions more as a narrative constraint than promotional material. Performances may be condensed, but minimal contextual prompts should remain so audiences understand that formation openings/closings and collective landings are not arbitrary choreography but relate to phrase function and order progression. A more robust approach is to back-link explanatory texts to graph evidence nodes so that the public sees not a monolithic "authoritative line" but an explanation pathway with sources and setting notes. When adaptations occur on stage, the scope and boundaries of adaptation can be clearly stated, reducing the drift toward contextless consumption.

In cross-cultural communication, the key is translation rather than mere linguistic conversion. Necessary transliterations should be paired with setting explanations; variants should not be forced into unity but explained through lineage and setting, enabling external audiences to

understand why movements hold within a community. Performance studies' insight on "reinterpretation within repetition" implies that the wider the circulation, the more important it is to avoid fixing one version as the sole standard, otherwise dissemination may in turn reshape tradition and squeeze internal diversity (Schechner, 2002).

7. Discussion

Multimodal knowledge graphs offer new organizational possibilities for dance ICH while also introducing boundaries and risks. The first is the risk of standardization. Structuring can induce the illusion of a single correct version, whereas the vitality of ICH dance lies in variants and locality. The evidence-chain mechanism is intended to preserve polyvocal narratives: it allows interpretations to coexist while requiring each to point to its sources, lineage, and setting so that differences can be discussed rather than flattened or authoritarianized.

The second concerns public boundaries and rights ethics. Dance ICH often includes segments and narratives unsuitable for public release; whether to publicize is a matter of community rights and ethical arrangement, not a technical decision. Encoding tiered visibility into context units and binding it to authorization, attribution, and versioning renders principles into mechanisms (UNESCO, 2003/2024).

The third concerns maintenance. The largest challenge for a graph is often not construction but sustained updating. While multimodal heritage-graph practices demonstrate the feasibility of multi-source integration (Fan et al., 2023), dance ICH relies more heavily on institutionalized maintenance: community co-building, expert review, version logs, and revision notes form a maintenance system. Without such a system, graphs quickly become outdated or devolve—under platform logic—into material heaps, and ultimately fail to support transmission.

8. Conclusion

Grounded in movement analysis and pedagogical translation in dance studies, this paper proposes a multimodal knowledge-graph framework for Tibetan–Qiang–Yi ICH dance. With the movement unit–context unit pairing as key granularity, we organize temporal, spatial, and dynamic structures into a relation system that supports evidence back-linking.

The main contributions can be summarized in four points: (1) Granularity: movement units as trainable short-phrase structures and context units that stabilize phrase function, role order, and taboo boundaries, preventing knowledge from stopping at "surface-form reproduction." (2) Structure: temporal–spatial–dynamic relations that integrate rhythmic alignment, formation coordination, and dynamic texture, supporting correction and review in classroom training. (3) Interpretation: an evidence-chain mechanism that binds proponents, lineages, and settings, rendering polyvocal interpretations traceable and contestable and avoiding the flattening of differences into a "single version" in digitalization. (4) Evaluation and governance: qualitative evaluation dimensions not dependent on quantitative statistics, coupled with governance mechanisms such as tiered visibility, attribution/authorization, and versioning, providing an observable and reviewable pathway for "graph-empowered inheritance."

This study also has limitations. First, the effectiveness of the graph and the evaluation pathway requires continued testing across broader lineages and settings. Second, communities may differ in how they negotiate public boundaries and interpretive rights; further work is needed to develop shareable annotation protocols and authorization templates. Future research may expand toward cross-lineage variant juxtaposition, classroom data feedback loops, and cross-platform dissemination governance to strengthen long-term maintainability and resilience.

Author Contribution

Qin Shi was primarily responsible for the implementation of this study, including data collection, organization, and analysis, conducting field research, and drafting the core sections of the manuscript, including the research background, methodology, results, and discussion. Yuxuan Li led the overall design and planning of the study, supervised its academic rigor and feasibility, coordinated the research process, contributed to the writing and revision of the manuscript, and oversaw submission-related communication and academic coordination.

Compliance with Ethical Standards

This study involved qualitative field-based documentation, classroom observation, and community-informed interpretive materials related to Tibetan–Qiang–Yi intangible cultural heritage dance. It did not involve medical, clinical, or animal experimentation. The research was conducted in accordance with relevant ethical standards for humanities and cultural heritage research. Oral explanations, teaching-related records, and contextual materials were used with appropriate authorization, and community-sensitive or restricted ritual knowledge was handled under tiered access and permission-based use.

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Competing Interest Declaration

The authors declare that they have no financial or personal competing interests in relation to the work reported in this manuscript. One author is affiliated with Panorama Scholarly Group, the publisher of this journal. This affiliation is disclosed in the interest of transparency.

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References

1. UNESCO. (2003). *Text of the Convention for the Safeguarding of the Intangible Cultural Heritage*[EB/OL].
2. UNESCO. (2024). *Basic Texts of the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage* (2024 version)[EB/OL].
3. Geertz, C. (1973). *The Interpretation of Cultures*. Basic Books.
4. Bourdieu, P. (1977). *Outline of a Theory of Practice*. Cambridge University Press.
5. Turner, V. (1969). *The Ritual Process: Structure and Anti–Structure*. Aldine.
6. Schechner, R. (2002). *Performance Studies: Introduction*. Routledge.
7. Kaeppler, A. L. (1978). Dance in Anthropological Perspective. *Annual Review of Anthropology*, *7*, 31–49.
8. Adshead, J. (Ed.). (1988). *Dance Analysis: Theory and Practice*. Dance Books.
9. Laban, R. von, & Lawrence, F. C. (1974). *Effort: Economy of Human Movement*. Macdonald and Evans.
10. Fan, T., Wang, H., & Hodel, T. (2023). CICHMKG: a large-scale and comprehensive Chinese intangible cultural heritage multimodal knowledge graph. *Heritage Science*.

11. Liang, W., De Meo, P., Tang, Y., & Zhu, J. (2024). A Survey of Multi-modal Knowledge Graphs: Technologies and Trends. *ACM Computing Surveys*.