A Study on the Pathways for Generative AI to Empower the Living Transmission and Curriculum Innovation of Guangfu Nursery Rhymes in Rural Kindergartens

Jingyuan Chen[1], Baoyi Lu[2], Jie An[3], Linyan Tan[4], Yingyi Chen[5]

[1,2,3,4,5] *School of Education, Nanguo Business College, Guangdong University of Foreign Studies and International Trade, Guangzhou, China*

ABSTRACT

Guangfu children's rhymes are an oral literary form sung in Cantonese and circulated among the folk of Lingnan, representing a precious resource for local culture education in kindergartens. However, under the backdrop of urbanization and the popularization of Mandarin, teaching Guangfu children's rhymes in rural kindergartens faces fourfold challenges in terms of teachers, resources, inheritance, and emotions, with the language gap between left-behind children and their grandparents being the most prominent. Based on questionnaires and literature, this paper analyzes the above issues and proposes a five-in-one improvement path— "AI rhyme agent + recording treasure box + rhyme creation workshop + digital distribution map + emotional compensation"—and uses the already established WeChat public account, a self-made recording treasure box, and age-grouped Cantonese rhyme lesson plans as practice samples to present concrete operations from program design to classroom implementation, providing a reference for empowering the living transmission of local culture with generative artificial intelligence.

Keywords: *Generative artificial intelligence, Guangfu nursery rhymes, Rural kindergartens, Living transmission, Curriculum innovation*

1. INTRODUCTION

Guangfu nursery rhymes, also known as Cantonese children's rhymes, are oral literature sung in Cantonese and passed down among the folk of Lingnan. Characterized by short lines, regular rhyme, and a close connection to everyday life, they are a valuable resource for local cultural education in kindergartens.

However, as urbanization advances and Putonghua becomes more widely used, the contexts in which Cantonese is spoken are shrinking. In rural kindergartens, it is common that teachers do not know how to teach, resources cannot be used, the content is not relevant, and families are unwilling to pass it on, leaving folk song inheritance at risk of interruption. Meanwhile, the new generation of information technologies represented by generative artificial intelligence (AIGC) offers new possibilities. Grounded in the dual context of rural revitalization and educational digitalization, this paper combines questionnaire surveys and literature review to analyze the four major challenges facing Guangfu nursery-rhyme teaching in rural kindergartens. It proposes a "five-in-one" pathway for living inheritance and curriculum innovation, and, drawing on completed practices such as a WeChat public account, an audio recording toolkit, and age-specific lesson plans, presents practical and replicable approaches to provide a reference for rural kindergartens and frontline teachers.

2. RESEARCH BACKGROUND

2.1 Policy Background

Under the policy directions of inheriting China's excellent culture, rural revitalization, and

education digitalization, the Opinions on Implementing the Project for the Inheritance and Development of Fine Traditional Chinese Culture and the Opinions on Comprehensively Advancing Rural Revitalization and Accelerating Agricultural and Rural Modernization provide a basis for the protection and inheritance of local culture[1]; the Guidelines for Kindergarten Education (Trial) and the Guide for the Learning and Development of Children Aged 3–6 propose making full use of local resources to carry out local cultural enlightenment[2]; the State Council's Opinions on Deeply Implementing the "AI+" Action and the Opinions of Nine Departments on Accelerating Education Digitalization provide policy support for generative artificial intelligence empowering preschool local-culture curricula[3]。

2.2 The Crisis of Inheriting Guangfu Children's Rhymes and the Cultural Mission of Rural Kindergartens

Guangfu children's rhymes originate from grassroots life and for centuries have relied mainly on oral transmission to provide cultural enlightenment to subsequent generations. They exhibit a distinctive "one song, multiple versions" characteristic — the same song is continuously rewritten and supplemented during its transmission, giving rise to versions with differing content.[4]The rhyme "Ji Gong Zai" has continuously evolved through oral transmission, reflecting the living feature of "one song, multiple versions"; however, as intergenerational singing contexts shrink, the updating of rhyme versions has gradually stalled, and their inheritance has become increasingly static and generationally interrupted. How to awaken their living transmission mechanism has become an urgent issue. Rural kindergartens are public institutions with relatively high cultural density in villages and serve as hubs connecting families, communities, and local memory. They are promising key sites for activating the living transmission of children's rhymes; but widespread deficiencies in teachers, resources, and curriculum make it difficult for them to shoulder this cultural mission independently, creating an urgent need for external technical assistance and professional support.

2.3 Opportunities for Generative AI to Empower Rural Early Childhood Education

Educational applications of generative artificial intelligence have shown potential in personalized learning, language teaching, and content generation, but existing research mostly focuses on urban schools or general teaching scenarios. Results targeting local culture teaching in rural kindergartens remain sparse, and insufficient attention has been paid to the real constraints of rural areas — "low computing power, weak networks, limited funding, and uneven teacher digital literacy"[5]. If technology blindly pursues being "high-end and cutting-edge," it may instead widen the urban – rural education gap; how to promote technology adaptation for rural areas and serve the living transmission of local culture with a "high-tech + low-threshold" approach is an important entry point for this study.

3. THE VALUE OF INTEGRATING GUANGFU NURSERY RHYMES INTO KINDERGARTEN EDUCATION

3.1 Cultural Value

Guangzhou folk nursery rhymes record the seasonal labor and everyday life of Lingnan families, and are vivid materials for young children to understand their hometown and get close to local culture[6]; the shared emotions and shared values they contain are conveyed and shared through the chanting of adults and children, making them an important resource for building the shared spiritual homeland of the Chinese nation, and also aligning with the concept of the "living transmission" of intangible cultural heritage[7]。

3.2 Linguistic Value

Guangfu nursery rhymes have a clear rhythm and are easy to remember, making them excellent material for cultivating language sense and ability; Guangfu nursery rhymes, storytelling, Cantonese xiangsheng (comic dialogue), and similar forms can all serve as appropriate teaching content.[8]The use of Cantonese's nine tones gives the nursery rhymes a musical quality; as young children chant them, they not only experience their mother tongue but also subtly complete early learning of speech, object recognition, and character recognition,

aligning with the language development stage of preschool children.

3.3 Aesthetic Education and Social Value

Nursery rhymes are naturally connected to singing, movement, and play, making them an effective vehicle for aesthetic education and the cultivation of aesthetic taste; because many nursery rhymes are performed as call-and-response, chains, or cooperative games, they help children learn to express themselves and interact with others, and to internalize virtues such as humility, friendliness, and respect for elders and care for the young.[9]They align closely with integrated education across the kindergarten's five major domains—health, language, social, science, and art — providing broad opportunities for curriculum development.

4. THE CURRENT REALITY OF TEACHING GUANGFU NURSERY RHYMES IN RURAL KINDERGARTENS

To clarify the current status of integrating Guangfu nursery rhymes in kindergartens, the research team previously conducted a questionnaire survey focusing on teachers' awareness, resource supply, and teaching implementation, and cross-validated findings by reviewing relevant literature. Existing studies have conducted surveys on teacher cognition, resource provision, and teaching practice, and some have pointed out that teaching Guangfu nursery rhymes in kindergartens commonly faces problems such as unclear curriculum positioning, monotonous instruction, insufficient use of multimodal resources, and lack of home-school collaboration; this paper reviews relevant literature for cross-validation on that basis.[10]Combining the revealed issues of teacher qualifications, resources, and interest from existing research, the structural challenges facing the teaching of Guangfu nursery rhymes in rural kindergartens can be summarized into four interwoven aspects.[11]Based on the questionnaire survey and literature analysis, the structural challenges facing the teaching of Guangfu nursery rhymes in rural kindergartens can be summarized into four interwoven aspects.

4.1 The Dilemma of Teaching Staff: Teachers' Insufficient Dialect Proficiency and Lack of Teaching Confidence

Given the limited funding and inadequate equipment in rural kindergartens, AI-generated standard Cantonese recitations and situational sound effects can be recorded into inexpensive recordable modules costing only a few yuan each to create a "sound children's songs wall," which can be placed in activity rooms, corridors, and outdoor activity areas[12]. Scene theory and research on immersive experiences show that immersive settings that engage learners through multiple senses help enhance their concentration and sense of cultural immersion. In the research team's 2026 survey, which adopted a stratified random sampling method, questionnaires were administered to 100 teachers from 10 rural kindergartens in Cantonese-speaking areas of Guangdong Province. Most teachers had only a limited understanding of Guangzhou folk children's songs and did not actively seek related information; previous surveys also found that as many as 91% of teachers "do not know how to teach" them, and 83% "do not understand the songs." Some teachers avoided teaching children's songs because they were worried about inaccurate pronunciation or making mistakes. Cantonese preserves characteristics such as the nine tones and six tone contours and the entering-tone codas, which pose a significant barrier for non-Cantonese teachers. Teaching often remains at the level of "leading students to read the lyrics," making it difficult for children to appreciate the charm of the songs. At the same time, teachers' ability to use information technology tools is also weak, further reducing their teaching confidence and creating a cycle of "the less capable they are, the less willing they are to teach; the less willing they are to teach, the less capable they become."

4.2 Resources: a Dual Shortage of Suitable, Usable Teaching Resources and Digital Support

First, the number of Guangzhou folk children's songs that truly match kindergarten curriculum content, children's interests, and cognitive characteristics is limited, and about 46% of teachers feel this acutely; second, there is almost a complete lack of digital, interactive teaching resources for rural kindergartens, while commercial children's song resources are mostly designed for urban

kindergartens and are relatively expensive; third, rural kindergartens generally face practical constraints such as insufficient smart devices, unstable internet connectivity, and limited funding, and both digital hardware/software support and incentive mechanisms are weak. Teachers "want to use them but have nothing to use," and both the frequency and quality of children's song teaching are affected.

4.3 Inheritance: a Disconnect Between Children's Song Content and the Lives of Contemporary Young Children

A considerable number of nursery rhymes reflect the life scenes of the agrarian era, and there is a temporal and spatial gap between them and the lives of today's rural children, who experience "express deliveries to the village" and the widespread use of smart devices. Students commonly describe Guangfu nursery rhymes as "from a long time ago," "old-fashioned," or "never heard of," making it difficult to arouse their interest in learning. In the absence of contextual guidance, nursery rhyme teaching easily devolves into "mechanical pronunciation drills," drifting away from its original aim of fostering an appreciation of beauty and poetic imagery. At the same time, existing practice emphasizes "preservation" over "creation," failing to fully extend the living tradition of Guangfu nursery rhymes' "one song, multiple versions," and transmission tends to become static. This is precisely an important reason why nursery rhymes are "passed down less and less."

4.4 Emotional Dilemma: the Language Barrier Between Left-behind Children and Their Grandparents

Left-behind children in rural families commonly experience intergenerational caregiving: grandparents tend to communicate in Cantonese, while grandchildren grow up in a Mandarin-dominant environment. This two-way language barrier not only blocks cultural transmission within the family, but also weakens emotional communication between grandparents and grandchildren. A survey shows that 85.25% of teachers regard the "lack of a social dialect atmosphere" as the greatest difficulty in incorporating Guangfu nursery rhymes into the curriculum, and one of its deeper manifestations is precisely intergenerational language discontinuity. Some studies point out that the singing of folk nursery rhymes is itself an educational practice that transmits feelings of home and homeland, and conveys culture between adults and children. If kindergartens focus only on the "teaching" within the classroom while neglecting the chain of "passing on" within the family, the inheritance of Guangfu nursery rhymes will be difficult to truly form a closed loop.

5. FIVE-IN-ONE: IMPLEMENTATION PATH EMPOWERED BY GENERATIVE ARTIFICIAL INTELLIGENCE

In response to the fourfold challenges above, this paper proposes a five-in-one implementation path— "AI rhyme agent + recording treasure box + rhyme creation workshop + digital distribution map + emotional compensation" — supported by lightweight generative artificial intelligence to construct a living-inheritance closed loop covering classroom teaching, activity creation, content production, resource integration, and family transmission.



Figure 1 Framework Diagram of the Five-in-one Implementation Path.

5.1 Using an AI Rhyme Agent to Break the Teacher Bottleneck

A lightweight Cantonese AI rhyme agent called "Little Rhyme," able to run on ordinary phones or tablets, is designed as a virtual companion incorporating Guangfu elements such as lion dance and lychee to enhance cultural affinity. Addressing teachers' insufficient dialect skills and teaching confidence, the agent has three core capabilities: first, standard Cantonese teaching and real-time pronunciation correction, capable of demonstrating line by line and identifying children's pronunciation deviations; second, interaction and cultural Q&A, able to explain folk knowledge behind the rhymes—such as labor festivals and folk games — serving as a "local culture mini-encyclopedia"; third, on-demand generation, automatically producing rhyme texts and simple melodies suitable for children's age based on themes, and creating lyric cards with Cantonese romanization (Jyutping), lowering the demonstration threshold for non-Cantonese-speaking teachers by "marking romanization and leaving leads for singing." The agent's value goes beyond "teaching on behalf of" to "empowering": it frees teachers from the awkward position of being required to demonstrate vocally, allowing them to return to roles as activity organizers, cultural guides, and emotional companions, achieving a teaching transformation through human-machine collaboration.

5.2 Creating a Low-cost Immersive Dialect Environment with Recording Modules

Given the reality of limited funds and insufficient equipment in rural kindergartens, AI-generated standard Cantonese readings and contextual sound effects can be recorded onto affordable recording modules that cost only a few yuan each to create "audio nursery rhyme walls" to be placed in activity rooms, corridors, and outdoor play areas. Scene theory and immersion research indicate that immersive contexts that engage learners' multiple senses help improve their focus and cultural immersion. Children can press a button to listen repeatedly and perform actions while listening; the total cost for a class can be kept under a few hundred yuan. The modules support offline playback, do not rely on campus networks or multimedia machines, and fit the actual conditions of rural kindergartens. The recording boxes free teachers from demonstrating verbally over and over,

allowing children to receive fragmented, low-cost language and cultural nourishment from the nursery rhyme audio during daily transitions.

5.3 Promoting Living Content Production Through Nursery Rhyme Creation Workshops

The vitality of Guangfu nursery rhymes lies in "being passed down and renewed from generation to generation." To address the detachment of content from children's lives and the ossification of transmission, the nursery rhyme creation workshop leverages AI rhyme suggestions and melody generation so that when children orally recount village life experiences, a draft nursery rhyme can be generated and then refined jointly by teachers and children.[7]Teachers can also guide children to incorporate contemporary scenes such as "express delivery entering the village," "drone operations," and "village entrance markets" into nursery rhymes, allowing the ancient form to carry fresh new life and thus continue Guangfu nursery rhymes' tradition of "one song, many versions" updated with the times in a contemporary context. Through the creation workshop, nursery rhymes shift from static heritage in need of "rescue" to living culture that children can actively participate in.

5.4 Integrating Scattered Cultural Resources with a Digital Nursery Rhyme Distribution Map

Leveraging a lightweight mini-program, a "digital nursery rhyme distribution map" is built to link each nursery rhyme with its source village, the person who recorded it, and the background of how it has been passed down. Teachers, parents, and villagers can all upload audio and listen on demand at the corresponding geographic markers. Artificial intelligence can also generate a "nursery rhyme postcard" from the work with a single click for sharing and dissemination.[11]The digital map weaves the scattered nursery rhymes found in villages, families, and kindergartens into a "visible and audible" cultural network: it not only makes it easy for rural teachers to "follow the map" in their teaching, but also fits the idea of random situational teaching "whenever an opportunity presents itself" — singing "Luoyu Da" on rainy days and "Da Xigua" when eating watermelon, allowing nursery rhymes to naturally blend into daily life. As children see their own voices being recorded and sung by others, their sense of participation in inheritance grows, and scattered resources thus move toward sharing and co-construction.

5.5 Rebuilding Intergenerational Communication Bridges Through an Emotional Compensation Mechanism

The emotional compensation mechanism is an innovative design response to the issue of rural left-behind families, and it is also the focus of this study. Through the "Nursery Rhyme Comes Home" task card, children are encouraged to sing the nursery rhymes they have learned to their grandparents; a "Speaking with One Voice Across Generations" showcase section is set up on platforms such as WeChat Official Accounts to publish works sung together by grandparents and grandchildren; at the same time, old nursery rhymes remembered by the older generation are collected, and after being denoised and organized by artificial intelligence, they are stored in the "Rural Cultural Memory Bank." In this process, nursery rhymes become a shared language between grandparents and grandchildren, providing left-behind children with a channel for emotional companionship while also bringing cultural inheritance back into warm family interaction. Emotional compensation enables "technology empowerment" and "humanistic care" to reinforce each other, and this is what distinguishes this study from ordinary educational informatization programs.

6. PRACTICAL EXPLORATION AND IMPLEMENTATION SAFEGUARDS

On the basis of the pathway design, the research team has already transformed the above ideas into tangible and operable outcomes.

6.1 Low-cost "Recording Treasure Box" and "Sound Nursery Rhyme Wall"

The project team selected a recordable module paired with buttons, batteries, and a casing to create a physical "Recording Treasure Box." Actual testing showed that the cost per unit was about 6–7 yuan (including casing decoration), and the basic version of 10 units had a total cost of about 45–65 yuan, far lower than commercial products with equivalent functions. Each treasure box recorded three types of content: a complete teaching-and-singing version, a sing-along version with pauses, and a scenario sound-effects version. Children can

repeatedly listen and follow along simply by pressing the button. When multiple treasure boxes are fixed to a wall or theme backdrop, with buttons and illustrations placed within children's reach and accompanied by colorful images, they form a "Sound Nursery Rhyme Wall," which has become a standard teaching aid in the lesson plan.

6.2 WeChat Public Account "Guangfu Rhymes Love AI Kindergarten Living Heritage Hall"

The research team created and operates the WeChat official account" Guangfu Rhymes Love AI Kindergarten Living Heritage Hall"which includes a column called "Guangfu nursery rhymes Station." Positioned as "focusing on the collation and revitalization of Guangfu nursery rhymes," it targets rural preschool teachers, kindergarten teachers, and early childhood education students. Each issue centers on one classic nursery rhyme, introducing its lyrics, cultural background, and educational value, while also offering AI-based teaching ideas such as generating rhythm maps, creating Cantonese Pinyin lyric cards, and organizing "nursery rhyme growth files." In this way, design concepts such as "digital distribution maps" and "emotional substitution" are turned into concrete content that can be read, shared, and used jointly by schools and families.

6.3 Age-specific Cantonese Nursery Rhyme Lesson Plans and Smart AI Cards

Based on the age-group goals in the Guidelines for Learning and Development of Children Aged 3–6, the research team developed several age-specific lesson plans covering the language and music domains of the junior, middle, and senior preschool classes. Examples include the junior class language activity "Wash Clean," the middle class music activity "The Big Elephant Can Dance" (a Shunde Cantonese nursery rhyme), and the senior class music activity "Color Song." The lesson plans follow a unified design logic: first, age-appropriate progression, with junior classes moving from "perception – imitation," middle classes from "scenario – movement," and senior classes from "creation–collaboration"; second, alignment across three dimensions, with each lesson plan setting cognitive, emotional, and skill-based objectives; third, integration of digital tools, with the recording toolbox, official account audio, and courseware running throughout the activity; fourth, a low-threshold approach, clearly stating that "perfectly standard Cantonese pronunciation is not required; what matters is feeling the rhythm," echoing the aforementioned teacher support; and fifth, a home-school extension loop, with each lesson plan including a segment for children to "recite (sing) it for mom and dad, and for grandparents" at home, providing an everyday channel for emotional substitution. In addition, the research team also produced matching "smart AI nursery rhyme cards," with nursery rhyme illustrations and a QR code on the front; scanning the code activates an AI agent for teaching the rhyme, correcting pronunciation, and answering folk-culture questions, making the cards easy to distribute to families.

6.4 Implementation Support and Promotion Strategy

First, strengthen teacher training and professional support by offering a "minimal-startup" tiered training model: begin with basic operations such as one-click playback and Q&A, then gradually introduce recording-based pronunciation correction and AI-assisted creation. Second, promote curriculum integration and pedagogical innovation by following the logic of "AI present—AI withdrawn," and using role-play, bodily movement, nursery rhyme chains, and small-group creation to get children moving and playing, preventing teaching from degenerating into "simply reading along to a machine." Third, deepen home-school-community collaboration by making "take the nursery rhyme home" a low-threshold optional task that can be completed as long as the child hums the rhyme and grandparents are present to listen, and by working with village cultural stations and New Era Civilization Practice Stations to run public nursery rhyme classes and parent-child activities. Fourth, carry out pilot iterations and impact evaluation by piloting the program in 2–3 rural kindergartens, following an action research cycle of "plan–act–observe–reflect," and through multiple rounds of iteration, form a replicable and scalable rural kindergarten teaching model of "AI + Guangfu nursery rhymes."

7. CONCLUSION

Guangfu nursery rhymes are a gift from Lingnan to childhood, and also a cultural bond linking local memory and intergenerational emotion. In the context of generally weak teacher staffing,

resources, content, and family support in rural kindergartens, generative artificial intelligence offers a viable path that balances “high technology” with a “low threshold”: using smart agents to offset shortages in teaching staff, a recording toolbox to ease equipment constraints, a creation workshop to renew content, digital maps to gather dispersed resources, and emotional substitution to connect with family affection. The research team has already built the WeChat official account “Guangfu Nursery Rhymes AI Living Heritage Center,” a self-made recording toolbox, smart AI cards, and age-specific Cantonese nursery rhyme lesson plans, which together form a preliminary implementation model and verify the feasibility of a low-cost technical route and the potential of home-school linkage. In the future, this approach could be extended to Hakka nursery rhymes, Chaoshan nursery rhymes, and other dialect regions of Lingnan, offering new digital preservation ideas for more forms of local culture that are on the verge of disappearing.

ACKNOWLEDGEMENTS

[Funding Project] This article is supported by the 2026 Guangdong Province College Student Innovation and Entrepreneurship Training Program Project, titled Research on the Paths for Generative Artificial Intelligence Empowering the Living Inheritance of Cantonese Nursery Rhymes and Curriculum Innovation in Rural Kindergartens (No. 2026XJ14).

REFERENCES

[1] General Office of the State Council. Opinions on Implementing the Project for Inheriting China’s Excellent Culture [Z]. 2017.

[2] Kindergarten Education Guidance Outline (Trial) [M]. Beijing: Beijing Normal University Press, 2001. State Council. Opinions on Further Implementing the “AI Plus” Action (Guo Fa [2025] No. 11) [Z]. 2025.

[3] Zeng Yingfeng. Folk Chanting in the Cultural Memory of Guangfu: On the Inheritance and [J]. Exploration, 2018(5): 96-103.

[4] Holmes W, Bialik M, Fadel C. Artificial Intelligence in Education: Promises and Implications for Teaching and Learning[M]. Boston: Center for Curriculum Redesign, 2019.

[5] Wu Peiqi. The educational practice of folk nursery rhymes in constructing the shared spiritual home of the Chinese nation—an analysis based on the classic nursery rhyme “Moonlight Bright” [J/OL]. Journal of Hubei Minzu University (Philosophy and Social Sciences Edition), 2026. DOI: 10.13501/j.cnki.42-1328/c.20260811.001.

[6] UNESCO. Convention for the Safeguarding of the Intangible Cultural Heritage [Z]. 2003.

[7] Pan Yingbin. Opening the Cantonese channel and entering Guangfu culture—on Cantonese teaching in kindergartens [J]. Education Observation, 2017, 6(22): 138-139.

[8] General Office, General Office of the State Council. Opinions on comprehensively strengthening and improving aesthetic education in schools in the new era [Z]. 2020.

[9] Zhang Wei. An exploration of the problems and countermeasures in teaching Guangfu Cantonese nursery rhymes and children’s songs [J]. Northern Music, 2020(18): 134-135.

[10] Deng Wenjing, Zhou Sha, Liu Jiao. Research on Improving the Information-Based Teaching Ability of Rural Kindergarten Teachers in the Context of Rural Education Revitalization [C]//Proceedings of the 8th Academic Symposium on Educational Information Technology Innovation. 2025.

[11] Wang Qian. Research on the interactive design of a Cantonese nursery rhyme app based on immersive experience and scenario theory [J]. Da Guan (Forum), 2019(3): 94-95.