

INNOVATIVE PRACTICE OF ENAMELLING-BASED ART HEALING: A CASE STUDY GROUNDED IN THE "THEORY-PRACTICE INTEGRATION" MODEL

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Abstract: This study takes the "Fa Cai Xin Yu" intangible cultural heritage enamel empowerment special education project as the carrier, and based on theories such as First Principles Thinking and expressive art therapy, constructs a "theory-practice integration" teaching model to explore methods to break through the dual bottlenecks of the lack of aesthetic education courses in special schools and the high threshold of traditional handicraft techniques. Through field research, the ability traits of children with special needs are clarified, and a three-tier progressive curriculum and a "three-teacher collaboration" interdisciplinary mechanism are designed. Technical adaptation strategies such as atomic task decomposition of enamel craftsmanship, compensatory assistive device innovation, and causal visual cognitive activation are simultaneously implemented. The study verifies through qualitative analysis that this model can effectively activate the psychological functions of special children, reshape their social identity, and establish a bidirectional healing mechanism between special children and university volunteers, achieving a win-win situation of cultural inheritance, art therapy, and inclusive education. This study provides a reproducible theoretical framework and practical path for the innovative application of intangible cultural heritage in the field of special education, and has important reference value for promoting the high-quality development of special education and the living inheritance of intangible cultural heritage.

Keywords: Intangible Cultural Heritage; Enamel Craftsmanship; Special Education; Art Therapy; Theory-Practice Integration

1 INTRODUCTION

In deep alignment with the national "14th Five-Year Plan for the Development and Improvement of Special Education", the integration of artistic participation into the special education system has evolved from a supplementary activity to a strategic priority for promoting holistic humanistic development. This policy shift reflects the transformation of the paradigm of special education: moving from traditional compensatory rehabilitation to a comprehensive "quality education" model that places greater emphasis on dignity, self-expression, and social integration. However, despite the clear policy direction, the practical implementation of aesthetic education in special schools still faces two major structural bottlenecks. Firstly, there is a severe lack of systematic aesthetic education courses that are rigorous in teaching and of high quality for students in special schools. Secondly, the inherent technical "threshold" of traditional handicrafts, which often requires highly refined motor control abilities and cognitive sequence memory abilities, poses an insurmountable obstacle for children with different sensory, cognitive, and physical characteristics.

To address the aforementioned gap, this study introduces and evaluates the "Fa Cai Xin Yu" project. The core of this project lies in breaking away from the traditional "technology-centered" teaching model, which often leads to frustration among children with special needs, and shifting towards the concept of "situational realization". By leveraging the unique material properties of enamel—especially its distinct mineral tactile texture, rich color layers, and the fascinating transformation of form during the firing process—the project aims to stimulate children's latent psychological and sensory functions.

This study argues that enamel craftsmanship is not merely a medium for jewelry creation, but rather a structured carrier of healing. The "Fa Cai Xin Yu" project integrates the "first principle" of craftsmanship - starting from the basic sensory contact between enamel glaze and metal base - to construct a "theory-practice integration" model. This article aims to systematically analyze the effectiveness of this model in promoting a triple transformation: from initial "artistic creation" to deep "psychological healing," and ultimately to "social empowerment" through cultural participation. By deconstructing the interaction process between special populations and the medium of enamel craftsmanship, this study provides a theoretical and practical framework for intangible cultural heritage (ICH) to become an accessible and transformative force in special education.

2 THE PARADIGM OF "THEORY-PRACTICE INTEGRATION" IN ENAMEL ART THERAPY

The theoretical foundation of this teaching model stems from the "first principle" of expressive art therapy: healing originates from the fundamental synergistic effect of sensory engagement and cognitive reconstruction. This section will deconstruct the "Theory-Practice Integration (TPI)" model, which transcends traditional craft teaching and achieves a seamless integration of neuropsychological theory and tangible material manipulation within a specialized healing context.

2.1 The Collaborative Integration of Theory and Practice

In the framework of enamel art therapy, "theory" is not an abstract dogma, but rather the neuropsychological mechanism that drives the intervention process; correspondingly, "practice" is the process of translating these theories into physical actions through the manipulation of metal and enamel glaze.

Cognitive Synchronization Based on Immediate Feedback: From a first-principles perspective [1], learning is most effective when the gap between "action" and "result" is minimized [1]. This model abandons mechanical, progressive teaching and uses the firing process as the vehicle for cognitive synchronization. As the kiln transforms the dull powder into a brilliant glaze, children receive immediate visual and tactile feedback. This "causal visualization" serves as a powerful cognitive mapping tool [2], helping children with intellectual disabilities or executive function deficits bridge the gap between abstract intentions and physical reality.

Technical Adaptation and Task Decomposition: The complexity of intangible cultural heritage enamel craftsmanship is decomposed into the most basic and indivisible units - the application of task analysis method. These units are simplified into safe and modular manual tasks that match the motor abilities of children with special needs. This "scaffolding design" ensures accessibility in the "practice" process [3], while not compromising the artistic integrity of the intangible cultural heritage craftsmanship. It embodies the core essence of "learning by doing", reinforcing children's theoretical understanding of spatial order and material properties through repeated creative actions. It also lays a methodological foundation for the subsequent atomic task decomposition and technical adaptation in Section 3.4.

2.2 Implementation Path of Situated Learning

The theory of situated learning posits that knowledge is inextricably linked to the environment in which it is constructed. The "Fa Cai Xin Yu" project focuses on creating a "social integration context" and building a dual-level environment that caters to both the physical and psychological needs of children.

Physical Context: Creating an Atmosphere in the "Master Studio": The workshop environment is deliberately designed to resemble a professional "master studio" rather than a clinical classroom. Based on the principles of environmental psychology, this professional setting serves as a catalyst for identity transformation. By utilizing high-quality materials and professional tools, the cognitive positioning of children's behavior is elevated from "rehabilitation training" to "real artistic creation". This bestowal of dignity is a core prerequisite for cultivating self-esteem and intrinsic motivation, allowing children to participate as "artisans" rather than "patients".

Psychological Context: Construction of a Micro-Social Ecosystem: Leveraging the one-on-one collaboration model between university volunteers and children with special needs, the project simulates a micro-social ecosystem that closely mirrors reality. Within this "safe space", volunteers, as "more knowledgeable others (MKOs)" within the children's zone of proximal development (ZPD) [3], facilitate nonverbal communication through the shared medium of craftsmanship, achieving emotional resonance that is difficult to achieve in traditional clinical or language-dominated settings. The shared goal of completing enamel works naturally establishes emotional connections, reduces social anxiety, and provides support for building interpersonal trust.

3 IMPLEMENTATION AND METHODOLOGY: A CASE STUDY OF "FA CAI XIN YU"

3.1 Field Research and Demand Analysis

To establish a rigorous empirical foundation for the intervention program, the research team conducted in-depth field research at Conghua Qizhi School and Guangzhou Kangna School from April to May 2025. By combining semi-structured interviews with special education experts and participatory observation of children's behavior, a comprehensive "needs analysis" was completed.

The research results reveal a significant "development paradox": children with special needs, especially those with autism spectrum disorders, often exhibit extraordinary intuitive sensitivity to subtle differences in color and visual patterns, but at the same time face serious obstacles in executing fine motor sequences and managing social anxiety in interactive scenarios. Based on these contradictory traits, the "Fa Cai Xin Yu" project has established a dual-core development strategy of "safety first, interest-driven" - "safety first" to ensure both physical and psychological safety, and "interest-driven" to leverage visual advantages to circumvent cognitive deficits. This strategy has also become the core principle to be followed in subsequent task analysis, technology adaptation, and curriculum design.

3.2 Three-Level Progressive Curriculum: Scaffolding Teaching Approach

Relying on the "situational realization" logic, the project designs a three-tier progressive curriculum. This hierarchical structure serves as a teaching scaffold, facilitating children's gradual transition from basic sensory engagement to complex social collaboration, forming a complete situational learning chain [4].

Phase 1: Sensory Arousal (Perception Layer): This introductory phase focuses on "sensory integration". Leveraging the unique granular texture and rich multi-layered color properties of enamel glaze, it provides children with low-stress multidimensional tactile and visual stimulation. This phase is crucial for alleviating the sensitive state of tactile defensive children and awakening their inherent curiosity through the "magic" of material transformation.

Phase 2: Emotional Projection (Expression Layer): Based on sensory adaptation, cloisonné enamel craftsmanship serves as the symbolic language. With the scaffolding support of the art therapist, children transform abstract and fragmented inner experiences into concrete and simple patterns. This process facilitates "emotional externalization", allowing children to express complex emotions that are difficult to convey through language.

Stage 3: Collaborative Co-creation (Co-creation Layer): The final stage towards "social integration". Children collaborate with university volunteers to complete a jewelry piece. According to Winnicott [5], such a space allows individuals to bridge their internal psyche with the external reality through a creative medium. This is further supported by Malchiodi (2012), who posits that the artwork functions as a "triangular" mediator, shifting the focus from direct interpersonal confrontation to a shared creative task. In the collaborative phase of the project, this buffer zone reduces social friction, enabling special needs children to engage in meaningful social interaction with volunteers without the immediate pressure of linguistic demands. This collaborative process not only reinforces technical skills but also builds a "low-anxiety social buffer zone".

By focusing on a shared third-party object - the artwork, children engage in natural task-oriented social interactions, effectively lowering the threshold for establishing stable social connections (Figure 1).

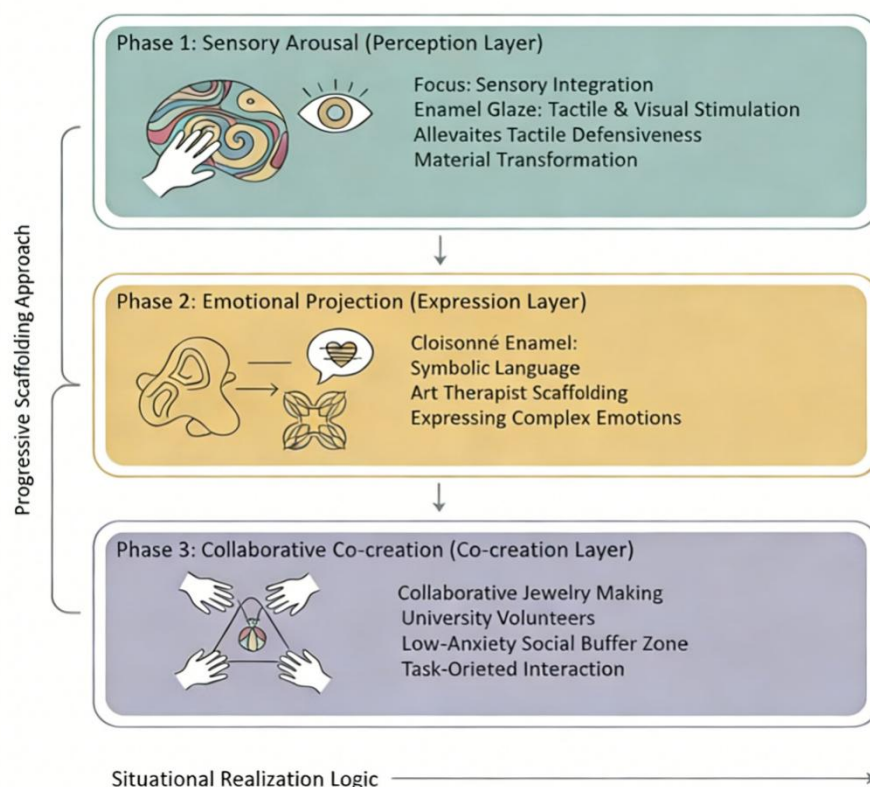


Figure 1 Methodological Framework: Three-Level Progressive Curriculum

3.3 "Three-Teacher Collaboration" Model: Cross- Disciplinary Synergy and Empowerment

To ensure the scientificity and safety of the intervention program, the project innovatively established a "three-professional collaboration" model, integrating the diverse professional abilities of intangible cultural heritage inheritors, psychologists, and special education teachers. This interdisciplinary matrix provides a "safety net" and a "knowledge bridge" for children.

The inheritors of intangible cultural heritage ensure the "authenticity and professionalism" of the craftsmanship, maintain high aesthetic standards, and allow children's works to gain value recognition as "genuine artistic creations"; psychologists provide "real-time clinical monitoring" to identify emotional triggers, ensuring that the creative process remains a healing "safe space" rather than a source of frustration; special education teachers act as "teaching facilitators", adapting the guidance of the inheritors of intangible cultural heritage to learning steps that align with each child's individualized education plan (IEP). The three collaborate to achieve a precise balance between artistic professionalism, psychological safety, and educational effectiveness.

3.4 Task Analysis and Technology Adaptation Strategy Based on "First Principles"

In the implementation process of the "theory-practice integration" model, how to transform the intricate and technically demanding intangible cultural heritage enamel craftsmanship into a healing medium that can be learned and operated by children with special needs is the core technical bottleneck that this study needs to overcome. Based on "First Principles Thinking" [6], the research team abandoned the traditional "imitation-based" teaching logic and reduced enamel

craftsmanship to the underlying operational logic of "material-sensory-cognition".

Through in-depth task analysis and compensatory assistive device innovation, precise adaptation of craftsmanship to the abilities of special children is achieved, providing core technical support for project implementation.

3.4.1 Atomic decomposition of process logic

The core essence of First Principles Thinking is to decompose complex systems into the smallest functional units that cannot be further divided, and then reconstruct and adapt the path based on the underlying logic. Relying on task analysis, the research team conducted atomic reconstruction and adaptive design for the core links in enamel craftsmanship that require high precision in fine movements:

Adaptation of "physical boundary" in the line drawing phase: The core pain point lies in the prevalent issue of weak spatial perception among children with autism and intellectual disabilities, making it difficult for them to precisely control the direction and scope of lines within a two-dimensional plane. To address this, the team replaced the highly flexible and open action of "wire-wrapping" with modeling, creating metal segmentation lines for the corresponding patterns on the metal base. From a first-principles perspective, this design essentially reduces "two-dimensional spatial control" to "one-dimensional physical guidance". The clear physical boundaries formed by the base provide instant tactile feedback, effectively alleviating children's operational anxiety, allowing their attention to naturally focus on the subsequent filling actions, and reducing cognitive load.

"Logical quantification" reconstruction of the Dian Lan (enamel filling) action: Traditional enamel filling relies on empirical "hand feel" control, which is highly abstract and uncertain for special children. The research team decomposed the enamel filling action into a standardized execution sequence of "material retrieval - quantity control - filling - spreading", and simultaneously constructed a visual color-coding system to simplify color selection from subjective aesthetic judgment to an objective "symbol matching" task. This logical decomposition and quantitative design help children establish a stable execution function sequence from fragmented sensory input, gradually forming an orderly operational cognition.

3.4.2 Compensatory assistive device innovation: design of "external functional compensatory body" for physiological limitations

Addressing the physiological limitations commonly found in special children, such as uneven muscle tension, hand tremors, and insufficient grip strength, the research team has designed a set of assistive device systems with compensatory functions. These systems serve as "external compensatory bodies" for children's physical functions, breaking the constraints imposed by physiological barriers on craftsmanship operations.

Ergonomic Pen Tip Adaptation: For children with insufficient grip strength or poor coordination in fine motor skills, a "thickened asymmetric enamel filling" will be developed. By increasing the diameter of the handle and enhancing the surface friction coefficient, the static muscle load required for children to maintain their grip posture is reduced, shifting the focus of operation from "difficulty in controlling the tool" to "focusing on expressing aesthetic sensibility", greatly improving operational feasibility and comfort.

High fault tolerance medium improvement: Based on a first-principles analysis of the intrinsic relationship between glaze particle size, filling difficulty, and operational fault tolerance, the team will specifically improve the glaze particle size, allowing children to make multiple attempts and repeatedly modify their works without damaging the basic structure, thereby establishing a "high fault tolerance mechanism." This design does not lower the craftsmanship standards, but rather transforms "operational errors" from a source of frustration into an adjustable experimental process, providing crucial support for the establishment of self-efficacy in special children.

3.4.3 Cognitive reconstruction cycle driven by "causal visualization"

The core value of First Principles Thinking lies in establishing clear underlying causal connections. The physical characteristic of "high-temperature firing inducing material transformation" in enamel craftsmanship provides a natural "instant feedback loop" for special children, serving as an important medium for cognitive reconstruction.

Instant physical verification reinforces causal cognition: When children observe the instant transformation of originally dry and shriveled glaze particles into a crystal-clear and plump glaze surface during the firing process, the strong visual impact can form a clear "operation-result" correspondence cognition. This concretized causal connection helps autistic children establish stable mental representations and gradually understand the connection between their own behaviors and the physical world [7].

Dual reinforcement constructs a cognitive upward spiral: After the completion of each atomization task, the "three-teacher collaboration" team provides immediate social reinforcement (such as targeted verbal praise, positive feedback), which forms a dual incentive with the visual aesthetic reinforcement after glaze firing, constructing a spiral upward dynamic system. This model not only helps children master craftsmanship skills, but also reconstructs their interaction logic with the physical world and social environment through the underlying path of First Principles Thinking, achieving implicit improvement in cognitive ability. The dual effectiveness of technical adaptation and cognitive activation also lays a core foundation for achieving subsequent multi-dimensional empowerment effects.

4 EFFECT ANALYSIS: MULTI-DIMENSIONAL EMPOWERMENT

4.1 Psychological Function Activation: From Sensory Stimulation to Internal Order Construction

Preliminary case observations and phenomenological records indicate that enamel art workshops have a significant stabilizing effect on the emotional state of children with special needs. The aforementioned enamel "enamel filling"

technique, whose core requirement is to carefully fill tiny metal grids with fine mineral pigments, serves as a powerful "psychological anchor" for children with autism spectrum disorder (ASD) or attention deficit hyperactivity disorder (ADHD). It can effectively "anchor" cognitive energy and significantly alleviate acute anxiety symptoms. This is also the indirect healing effect brought by the "high fault-tolerant mechanism" and "causal visualization" in technology adaptation. From the perspective of neuropsychology, this activation stems from multi-sensory integration. The unique tactile feedback of granular glaze and the rhythmic repetitive characteristics of the craft contribute to the "flow state" proposed by Mihaly Csikszentmihalyi [8]. In this state, the sensory visual feedback of gorgeous glaze, as a non-linguistic stimulus, bypasses language barriers and helps children establish an internal psychological order. By transforming fragmented sensory input into coherent artistic output, children's self-regulation ability is enhanced, sensory seeking behavior is reduced, and a critical transition from external chaos to internal focus is achieved.

4.2 Achieving Social Value and Aesthetic Literacy: Reshaping Identity

The social dimension of the project focuses on the transformation from individual creation to collective recognition. The jewelry artworks created by college volunteers are not only healing vehicles, but have also won multiple professional awards such as the BICC Oriental Design Award. These achievements are crucial for reshaping the social identity of the participants.

This process promotes the transformation of identity from a "passive recipient of social welfare" to an "active creator of cultural value". Based on Albert Bandura's self-efficacy theory, the positive feedback loop from creative success to public display cultivates a solid sense of self-worth. Furthermore, by rooting aesthetic experiences in the inheritance of intangible cultural heritage, children develop cultural confidence, no longer viewing themselves as "defective", but rather as inheritors of traditional craftsmanship, achieving social empowerment that traditional compensatory education cannot match.

4.3 Bidirectional Healing Mechanism: Symbiotic Relationship in Situated Learning

The distinctive feature of the "Fa Cai Xin Yu" project lies in the establishment of a bidirectional healing mechanism within a contextual learning environment. This mechanism breaks away from the "unidirectional empowerment" paradigm, emphasizing the reciprocal exchange of emotions and social values [9]. For university volunteers, participating in the "The stress relief workshop under the Fa Cai Xin Yu project" and collaborating with special children in creative endeavors serves as an immersive haven to alleviate academic stress. The tactile engagement with enamel materials aids college students in achieving "digital detoxification", offering psychological solace amidst the slow pace of traditional craftsmanship. This resonates with the emotional stability that special children gain through crafts, forming a bidirectional echo. More importantly, collaborative creation serves as a bridge for fostering empathy skills.

Through one-on-one interactions, volunteers transcend superficial sympathy and gain a deeper understanding of the unique perspectives and creative talents of individuals with special needs. This two-way interaction deconstructs ingrained social stereotypes and narrows the "social distance" [10]. In this symbiotic relationship, children with special needs acquire social skills and emotional stability, while college students gain a sense of social responsibility and emotional maturity. The project thus builds a miniature inclusive society, where both parties achieve cognitive growth and value recognition, providing a sustainable model for social integration through art.

5 RESEARCH LIMITATIONS AND REFLECTIONS

As an exploratory practical study, this project still has limitations in terms of research scope, methodology, and evaluation system, which need to be improved in subsequent research. At the same time, it provides a rational reference for the promotion of the results and also offers a basis for improvement in the standardized and professional development direction of the future outlook section.

Firstly, there is a limitation in the scope of the sample. This study only selects two special schools as practical scenarios, and the types of disabilities and age groups covered by the sample are relatively limited. Moreover, influenced by regional culture, the universality of the research conclusions needs further verification. In the future, it is necessary to expand the scope of research and practice, include special children groups from different regions and with different types of disabilities, and enrich the diversity of the sample to enhance the representativeness of the results.

Secondly, the homogeneity of research methods. Currently, effect evaluation primarily relies on qualitative research, relying on subjective data such as observations and feedback, without the support of long-term quantitative tracking (such as psychological scale assessments and behavioral indicator statistics). This makes it difficult to accurately quantify the persistence and stability of intervention effects. In the future, it is necessary to establish a "qualitative + quantitative" mixed research approach, combining standardized psychological assessment tools with long-term behavioral tracking data, to enhance the scientific nature and persuasiveness of research conclusions.

Thirdly, there is room for improvement in the curriculum and evaluation system. Although the existing three-tier curriculum has achieved progressive design, differentiated adaptation for children with different levels of impairment still needs to be refined; the evaluation system focuses on process feedback and lacks standardized outcome evaluation indicators. In the future, it is necessary to optimize the modular design of the curriculum, increase tiered tasks, and construct a standardized evaluation system covering psychological, social, and artistic dimensions to provide precise basis for curriculum iteration and model promotion.

6 CONCLUSION AND FUTURE OUTLOOK

The "Fa Cai Xin Yu" project provides a pioneering exploration in the intersection of traditional craftsmanship and modern healing teaching. By adhering to the core principles of "theory-practice integration" and "situational learning implementation", and combining the task analysis and technology adaptation strategies described in Section 3.4, the project fully demonstrates that intangible cultural heritage (ICH) is not a static historical relic, but a dynamic and multifunctional tool in contemporary special education. This integration model achieves a precise balance between the three core areas of cultural heritage protection, expressive arts therapy, and inclusive education.

In summary, the study has found that the structure and aesthetic attributes of cloisonné craftsmanship are highly aligned with the developmental needs of children with special needs. Through the technical adaptation strategies outlined in Section 3.4, complex craftsmanship is transformed into accessible "contextualized" experiences, effectively activating children's latent psychological functions and promoting social adaptation. Simultaneously, the "three- teacher collaboration" model and the three-tier progressive curriculum are leveraged to achieve a mutually beneficial integration of cultural inheritance, artistic healing, and inclusive education. This study opens up a new path for the innovative inheritance of intangible cultural heritage, demonstrating that traditional art can revitalize social vitality by responding to humanistic needs. It also provides empirical references for educational practitioners and policymakers, facilitating the integration of cultural heritage into social welfare and mental health systems.

To ensure the long-term sustainability and scalability of the "Fa Cai Xin Yu" model, this study identifies two major directions for future development:

Pattern standardization and system promotion: The core priority is to shift from regional case studies to standardized teaching frameworks. It is necessary to develop modularized teaching materials integrating intangible cultural heritage (ICH) and art therapy, systematically organizing teaching objectives, process norms, and safety guidelines that are suitable for different types of disabilities. Furthermore, establishing a comprehensive evaluation system that encompasses both artistic and psychological indicators is crucial for verifying the effectiveness of interventions in different institutional settings. By providing replicable theoretical and practical tools, we aim to promote the widespread adoption of the ICH-empowering special education model in more special schools and inclusive education centers.

Career Connection and Socio-Economic Empowerment: In the future, the focus will be on building a sustainable bridge connecting "aesthetic healing" and "vocational skill acquisition". Based on the premise that psychological stability is the foundation of social independence, the project plans to upgrade the curriculum to a formal vocational training path for disabled youth. By integrating professional-level enamel craftsmanship into special education vocational courses and collaborating with cultural and creative enterprises, we aim to empower special needs groups with market-compatible skills. The transition from artistic healing to economic participation not only lays the foundation for their independent living but also achieves long-term and stable value empowerment, allowing them to reintegrate into the social production system as skilled artisans and creators.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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