



Digital Literacy and Cultural Expression: How TikTok Reimagines Traditional Dance

Martina Shalaty Putri

Communication Science, Universitas Mercu Buana, Jakarta, Indonesia

<http://dx.doi.org/10.18415/ijmmu.v12i11.7138>

Abstract

This study explores how traditional dance is reimagined and performed within the digital ecosystem of TikTok, focusing on the experiences of dance instructors at Yayasan Ayodya Pala, a cultural institution in Indonesia. Using a qualitative case study approach and guided by the Social Construction of Reality, the Culture of Connectivity, and Crystallization, the research investigates how cultural meanings are constructed, negotiated, and circulated in algorithmic environments. Data were collected through in-depth interviews with three instructors from different generations, revealing how they integrate digital literacy into pedagogical practices and cultural preservation efforts. The findings show that TikTok functions not only as a promotional and educational medium but also as a platform for cultural negotiation—where instructors balance tradition with digital aesthetics to reach broader, younger audiences. This study highlights the role of digital literacy as a form of cultural competence, positioning dance instructors as cultural mediators who adapt sacred and artistic expressions into participatory digital formats. In doing so, the research contributes to our understanding of how traditional arts evolve in response to platform-driven dynamics and youth engagement in the digital age.

Keywords: *Traditional Dance, TikTok, Digital Literacy, Cultural Expression, Social Construction*

Introduction

In the digital era, TikTok has become a dominant platform where dance no longer exists solely in rehearsal rooms, stages, or classrooms, but is instead constructed and circulated through digital interactions. One of the most notable phenomena on TikTok is the emergence of dance challenges, where users upload videos of themselves dancing to a particular choreography, inspiring others to replicate the same routine. These participatory trends illustrate how dance has shifted from a traditionally institutionalized and performative art form into a socially constructed practice within the digital sphere.

As observed by Ambarwati and Utina (2022), dance challenges on TikTok have significantly influenced the interest of adolescents in learning dance, as they often practice routines before recording their performances for social media (Ambarwati et al. 2022). This shift illustrates the repositioning of

digital media not just as a medium of representation, but as an active space of learning, participation, and identity formation for young dancers.

The rise of TikTok as a cultural space aligns with a broader transformation in how dance is experienced and validated. Previously, recognition within the dance world was granted through participation in formal performances, academic credentials, or competitions. Today, social media presence plays a crucial role in building a dancer's credibility and extending their reach (Daychak 2023). TikTok, in particular, serves as a venue where dance becomes a shared social reality—constructed, validated, and circulated among digital communities.

Globally, TikTok has emerged as one of the most widely used social media platforms, with over 1.054 billion monthly active users as of February 2025 (statista 2025). Indonesia ranks second only to the United States in terms of user numbers, reaching approximately 107.7 million active users in 2025. This indicates not only TikTok's explosive growth but also its cultural centrality among young Indonesians.

The relevance of social media in constructing social reality can be understood through the lens of *The Social Construction of Reality* by Berger and Luckmann (1966). According to their theory, reality is shaped by a dialectical process involving externalization (expression of ideas into the world), objectivation (the perception of these expressions as objective truth), and internalization (the acceptance of these truths as personal and collective reality) (Puji 2016). On TikTok, dancers externalize their artistic expressions through videos, which are then objectified by being liked, shared, and replicated. Eventually, such interactions lead to the internalization of dance trends as legitimate expressions of artistic identity.

Similarly, van Dijck (2013) conceptualizes *The Culture of Connectivity* to describe the role of social media platforms not just as neutral tools for communication, but as sociotechnical systems that shape connections, norms, and cultural expressions. TikTok not only fosters connectedness between users but also structures connectivity through its algorithms, content moderation policies, and business models that define which types of content are seen, amplified, or sidelined (Anne Kaun 2014). Viral dances are not purely the result of organic creativity—they emerge through the interplay between user agency and the platform's technological architecture.

In addition, Wohn and Bowe (2014) propose the Crystallization framework, suggesting that social media users act as neo agenda-setters by curating meaning through repetitive interactions, exposure, and social engagement (Wohn and Bowe 2016). Reality, within this context, is fragmented, situational, and shaped by the dynamics of digital networks and community interactions. In the case of dance, the perception of what constitutes "traditional" or "popular" art is influenced by the rhythms of virality, exposure, and feedback loops within the TikTok ecosystem.

Another critical factor shaping this transformation is digital literacy—the ability not only to operate digital tools but to critically navigate digital culture. As Sabili et al. (2023) emphasize, understanding ethical use, content strategies, and the psychological implications of digital participation is essential for artists (Sabili et al. 2023). Without such awareness, dancers may face various challenges, including exposure to unrealistic beauty standards, cyberbullying, and social pressure that could impact mental well-being. Digital literacy is, therefore, both a technical and cultural competency necessary for survival and success in the contemporary digital performance space (Bejakovi 2020; Erstad 2010; Reddy, Chaudhary, and Hussein 2023).

Despite its importance, the intersection of digital literacy and performing arts—especially traditional dance—has received limited scholarly attention. Most studies still focus on literacy in formal educational settings (Reddy et al. 2023) or on other digital concerns such as mental health (Griffith et al. 2021), leaving a gap in understanding how dance instructors and young performers engage critically and constructively with digital platforms. Addressing this gap is crucial in the context of Indonesia, where traditional culture and digital modernity intersect in dynamic and sometimes conflicting ways.

Research Purpose and Theoretical Framework

This study aims to explore how dance instructors at Yayasan Ayodya Pala, a leading Indonesian performing arts institution, construct the meaning of traditional dance in digital spaces—particularly on TikTok. Founded in 1981, Ayodya Pala has a long-standing mission of “Building the Nation through Arts and Culture,” with more than 3,000 students and over 150 instructors comprising artists and academics. The foundation plays an active role in promoting Indonesian dance through education, national cultural preservation programs, and international performances.

Three Theoretical Perspectives Guide the Analysis:

This study adopts a multi-theoretical framework that integrates three key perspectives: Berger and Luckmann’s Social Construction of Reality, Crystallization by Wohn and Bowe, and José van Dijck’s Culture of Connectivity. Together, these frameworks provide a robust lens for understanding how traditional dance is constructed, mediated, and sustained in digital platforms such as TikTok, especially in the context of a cultural institution like Yayasan Ayodya Pala.

The Social Construction of Reality (Berger & Luckmann, 1966)

Peter L. Berger and Thomas Luckmann (1966) propose that social reality is not an objective given but is constructed through human interaction and communication. According to their framework, social reality is formed through a three-stage dialectical process (Puji 2016):

- **Externalization:** Individuals express themselves through actions, language, and symbols. In the TikTok context, this includes the creation and performance of traditional dance content by users, instructors, or communities.
- **Objectivities:** These external expressions become “objectified” or socially recognized as shared meanings. On TikTok, when dance videos gain likes, comments, and shares, they attain a form of social validation.
- **Internalization:** The socially validated meanings are absorbed back into the consciousness of individuals, becoming part of their knowledge and belief systems. For example, young users may come to view TikTok as a legitimate platform to learn, appreciate, or promote traditional dance.

In this sense, the use of TikTok by dancers and instructors is not merely a digital adaptation—it is an act of constructing new social realities around traditional dance. What counts as “authentic,” “creative,” or “valuable” in dance is no longer solely decided by cultural institutions but also negotiated through platform engagement (Puji, 2016).

Crystallization: Digital Realities and Networked Meanings (Wohn & Bowe, 2016)

Building on the idea of socially constructed reality, Wohn and Bowe (2016) introduce the concept of Crystallization to explain how social media facilitates the formation of meaning in complex, fragmented ways (Wohn and Bowe 2016). Crystallization views reality not as a monolith but as an aggregation of collective, transient perceptions that evolve through digital interaction. In TikTok, meanings around dance are constructed through:

- **Content exposure:** Repetition of certain dance trends, symbols, or movements.
- **Social interaction:** Likes, duets, stitches, and algorithmic amplification.

Rather than producing a single narrative, crystallization enables multiple realities to coexist—e.g., traditional dance as heritage, as entertainment, or as a trend. These are shaped by the network behavior of users, influencers, and algorithms. Thus, crystallization is key to understanding how traditional dance is being reframed in digital contexts—not lost, but continuously negotiated (Wohn & Bowe, 2016).

Culture of Connectivity (José van Dijck, 2013)

José van Dijck's (2013) notion of the Culture of Connectivity provides a critical framework for understanding the technological and economic infrastructure that shapes user interaction on social media (Anne Kaun 2014). Unlike earlier views that saw platforms as neutral spaces for connection, van Dijck argues that platforms are engineered systems designed to promote certain behaviors, values, and content through algorithmic control and data commodification.

In this model, two key dynamics operate:

- **Connectedness:** The social dimension—users sharing and interacting voluntarily.
- **Connectivity:** The technical-structural dimension—platforms shaping interactions through algorithms, ranking systems, monetization, and curation.

TikTok exemplifies this dual system. While users may post dance videos for cultural sharing (connectedness), their visibility and reach are heavily shaped by algorithmic mechanisms like the "For You Page" and trending sounds (connectivity). Therefore, traditional dance content that goes viral does so not only due to artistic merit but also because it fits platform logic—short length, visual appeal, participatory potential, etc. (Anne Kaun 2014).

This framework helps us see that the preservation and promotion of traditional arts online is not neutral—it is influenced by socio-technical structures. Cultural producers (like Ayodya Pala's instructors) must therefore become digitally literate not only in performance but also in navigating and manipulating these systems.

By applying these theoretical lenses, the study interrogates how dance instructors at Ayodya Pala engage with TikTok not just as users, but as cultural agents actively shaping and reshaping the meanings of tradition, identity, and artistry in a digitally networked society.

Methodology

This study adopts a qualitative research design employing an exploratory case study approach to investigate how traditional dance is socially constructed through digital platforms, with a specific focus on TikTok. The case study methodology enables a comprehensive, context-rich examination of meaning-making practices within a bounded setting (Yin 2018). It is particularly suitable for exploring contemporary phenomena embedded in real-life contexts where the boundaries between phenomenon and context are not clearly evident.

The research focused on Yayasan Ayodya Pala, a prominent cultural and dance institution in Indonesia, which integrates traditional performing arts education with digital media practices, especially through platforms such as TikTok. This makes it a compelling site to explore how dance instructors—both senior and young—engage with digital tools for cultural expression, pedagogy, and identity construction.

Theoretically, this study is grounded in the Social Construction of Reality (Berger & Luckmann, 1966), which conceptualizes reality as socially produced through processes of externalization, objectivation, and internalization (Puji 2016). This framework provides a lens to understand how traditional meanings are reconfigured and reconstructed through social practices, including those mediated by digital platforms.

To address the specificities of digital environments, the study also draws on:

Culture of Connectivity (van Dijck, 2013), which illuminates how platform logics, algorithms, and sociotechnical affordances shape user participation and content visibility (Anne Kaun 2014). Crystallization (Wohn & Bowe, 2016), which describes how meanings on social media emerge through a continuous, multimodal, and recursive process (Wohn and Bowe 2016). Rather than forming a single coherent narrative, meaning "crystallizes" from diverse interactions, representations, and expressions within the platform's ecosystem.

This triangulated theoretical lens enables a nuanced investigation into how traditional dance meanings are constructed in digital contexts, and how digital literacy becomes central to navigating these meaning-making processes.

Case Selection

Yayasan Ayodya Pala was selected as the single case study based on its:

1. Long-standing contribution to preserving and promoting traditional Indonesian performing arts.
2. Active use of social media platforms, particularly TikTok and Instagram, for educational and promotional purposes.
3. Engagement of both senior and young instructors in digital content creation and pedagogy.
4. Institutional focus on youth cultural education, supported by over 150 instructors and more than 3,000 students annually.

This institution represents a rich context to examine the intersection between traditional cultural values and contemporary digital engagement.

Participants and Data Collection

Primary data were collected through in-depth, semi-structured interviews with three dance instructors at Yayasan Ayodya Pala. Participants were selected purposively to capture diversity in age, experience, and digital media engagement:

1. Nurlela Qodariyah (41 years old) – A senior instructor recognized for producing educational digital content centered on traditional cultural values.
2. Brynadia Nurfaulziyyah (18 years old) – A young instructor who creates creative and playful TikTok content tailored for children and beginner audiences.
3. Citra Sari (17 years old) – A tech-savvy instructor who blends traditional dance pedagogy with adaptive and experimental digital approaches.

Each interview was guided by themes including:

- Motivations for using TikTok for cultural education and promotion.
- Perceptions of authenticity, identity, and representation in digital dance content.
- Reflections on digital literacy and platform-specific strategies.
- Views on the negotiation between tradition, innovation, and media aesthetics.

In addition to interview data, supplementary documentation was obtained from the internal archive of Yayasan Ayodya Pala. This included organizational profiles, coaching structures, and content descriptions relevant to their cultural programs. While the study did not include direct observation or digital ethnography, the internal documents provided institutional background necessary to contextualize participants' narratives.

Data Analysis

The data were analyzed using reflexive thematic analysis, following Braun and Clarke's (2006) six-phase framework (Clarke and Braun 2012):

1. Familiarization with the data
2. Generating initial codes
3. Searching for themes
4. Reviewing themes
5. Defining and naming themes
6. Producing the report

Thematic analysis was both inductive and theory-driven. The researcher identified patterns that emerged from participants' experiences while mapping them onto the theoretical constructs of social construction, platform culture, and crystallization.

The use of crystallization (Wohn & Bowe, 2016) was particularly important in acknowledging the fragmented yet interconnected ways meaning is produced and interpreted in digital spaces. Rather than treating social media content as fixed, the analysis viewed it as part of an ongoing meaning-making process involving repetition, remix, interaction, and platform-mediated visibility.

Result

This study investigates how dance instructors at Yayasan Ayodya Pala construct the meaning of traditional dance within a digital environment, specifically via TikTok. Through a reflexive thematic analysis of semi-structured interviews with three instructors representing different generations and experiences, six key themes emerged. These themes are closely aligned with Berger and Luckmann's (1966) theory of the Social Construction of Reality, the Crystallization perspective (Wohn & Bowe, 2016), and José van Dijck's (2013) Culture of Connectivity. The findings illuminate the dynamic interplay between individual agency, cultural tradition, and digital platforms in shaping the meanings of traditional dance.

1. Internalization of Cultural Values from an Early Age

All three instructors—Nurlela, Brynadia, and Citra—were introduced to dance during early childhood, typically through family participation in artistic or community rituals. This early exposure shaped their sense of cultural identity and rooted dance deeply in their social and emotional development. For example, Nurlela stated, "I started dancing when I was in elementary school because my parents were active in traditional arts. We often performed in community or school events." Brynadia shared, "My mom took me to join dance rehearsals when I was still in kindergarten. From there I got used to and enjoyed dancing." Similarly, Citra explained, "Since I was a child, my parents involved me in the foundation's activities."

This process reflects the primary stage of social construction: internalization, where external cultural values become embedded within the self through interaction with significant others. In this context, the family functions as a cultural transmission unit, and the dance studio serves as a space for identity formation.

2. Transformation of the Instructor's Role in the Digital Era

The role of a dance instructor has evolved from being a transmitter of traditional choreography to a hybrid figure: educator, digital content creator, community builder, and algorithm-aware communicator.

Citra remarked, "I need to understand what kids like on TikTok, so the content has to be visually attractive while still carrying cultural values." Nurlela expressed concern about cultural dilution: "Nowadays, instructors must preserve traditional values so they're not eroded by digital trends, but we still have to adapt."

This transformation reflects the crystallization of identity (Wohn & Bowe, 2016), wherein a person integrates multiple social roles that may seem contradictory. Their practice illustrates that tradition and innovation are not mutually exclusive but can coalesce into new forms of cultural authority.

3. TikTok as a Medium for Cultural Objectification

TikTok serves as a tool for the externalization and objectification of culture. Through short-form videos, instructors present dance routines, cultural symbols (e.g., costumes, gestures), and contextual explanations.

Brynadia shared, "I usually use songs that children recognize but still incorporate traditional movements. When the video gets a lot of views, I'm happy because it means our culture is being recognized." Citra explained how likes and comments become indicators of impact: "If there are many likes, I feel it means the audience understands and appreciates the values I'm trying to share."

When videos receive engagement (likes, comments, shares), the meanings embedded in them become objectified as part of a new collective understanding of dance. However, this process also introduces new challenges. Instructors noted that modernized or remixed versions of traditional dance are more likely to gain traction.

4. Negotiating Tradition and Digital Aesthetics

Instructors actively negotiate the tension between upholding cultural integrity and adapting to platform aesthetics.

Citra noted, "I still teach basic classical movements, but I give room for improvisation so the content doesn't look too rigid. Kids enjoy it more that way." Brynadia added, "I combine traditional dance moves with modern music and fun lighting effects to make it appealing on TikTok." These acts of cultural negotiation highlight instructors' agency in choosing what elements to preservemodify, or innovate. This theme underscores the dialectical nature of social construction.

5. Digital Literacy as Cultural Competence

Digital literacy emerged not only as a functional skill but as a form of cultural competence. Nurlela recounted, "I learned video editing from YouTube. It was hard at first, but eventually I got the hang of it." Citra mentioned, "I study TikTok trends by exploring and watching other creators' videos. That helps me figure out the right formats for my audience." Their ability to navigate algorithmic rhythms, audience analytics, and editing techniques transforms them into platform-savvy cultural agents. This is a clear example of internalization in the digital age.

6. Ethics and Innovation in Online Dance Education

Despite the pressures of platform performance, instructors displayed strong ethical awareness.

Citra stated, "Not every dance should be turned into a funny video. Some are sacred and must be respected." They also implement pedagogical innovation, such as using TikTok for quizzes and creative tasks.

Brynadia said, "I once gave an assignment to my students to create a TikTok video based on our practice. They got really excited about it."

This reflects an emerging ethos where TikTok is not merely a space of content distribution but a site of participatory education.

Synthesis and Interpretation

Taken together, the findings reveal how the meanings of traditional dance are:

- Externalized through performance and content production (Berger & Luckmann, 1966),
- Objectified through social validation and platform visibility,
- Internalized through evolving roles and reflexive adaptation.

These processes are shaped by the crystallization of instructors' identities (Wohn and Bowe 2016) and the connectivity logic of digital platforms (van Dijck, 2013 (Anne Kaun 2014)). Rather than viewing the digital realm as a threat to cultural authenticity, instructors at Yayasan Ayodya Pala demonstrate how digital media can facilitate cultural continuity, innovation, and collective meaning-making.

From a social constructionist perspective, each instructor is not only transmitting cultural values but also negotiating and redefining them through digital actions. The family-based cultural foundations laid during childhood (internalization) are reactivated and reframed in the digital space. Through TikTok, dance is re-performed (externalization), receives validation via engagement (objectivation), and reshapes how the instructors see their roles (internalization again)—creating a full loop of social construction.

Crystallization contributes to understanding this layered complexity: each instructor embodies multiple social roles—teacher, influencer, learner, guardian of culture—which often coexist or even conflict. Their stories show that cultural identity is fluid and multidimensional, influenced by generational knowledge and digital fluency.

Additionally, van Dijck's notion of connectivity reveals how platforms like TikTok are not passive stages but active agents. The algorithm prioritizes specific formats and aesthetics, guiding what cultural expressions get seen and shared. Therefore, digital platforms co-construct meaning alongside users.

This study contributes to an understanding of how tradition is not only preserved but transformed within algorithmic systems—creating a new space where identity, education, and cultural expression merge. As such, TikTok and similar platforms should be seen not only as commercial tools but as cultural actors—mediating practices, relationships, and representations (Anne Kaun 2014).

Thus, traditional arts like dance are no longer confined to physical studios or ceremonial events; they are dynamically reconstructed through digital expression, guided by instructors who serve as cultural bridges between generations, platforms, and pedagogies.

Conclusion

This study concludes that dance instructors at Yayasan Ayodya Pala play a pivotal role in reconstructing the meaning of traditional dance within digital spaces, particularly through the TikTok platform. The process of meaning-making unfolds through the three key stages described in Berger and Luckmann's theory: externalization, objectivation, and internalization. Traditional dance is not merely taught as a set of movements; it is reinterpreted as a form of expression, identity, and communication that resonates within the digital era.

TikTok serves both as a medium for cultural expression and as a pedagogical and promotional tool. Instructors do more than deliver dance techniques—they also convey cultural values, digital ethics, and visual adaptation strategies aligned with algorithmic flows and social media trends. Within this

context, social media becomes a critical arena for cultural preservation—not as a distraction from tradition, but as a generative space for re-creation.

Armed with digital literacy, creativity, and a deep understanding of platform dynamics, these instructors construct new cultural realities that are socially and algorithmically connected. Their role becomes vital in bridging generations, balancing traditional norms with technological innovation, and navigating between physical and digital spaces.

Recommendation

Based on the findings, this study recommends that the arts community and Yayasan Ayodya Pala consider developing ongoing training programs for dance instructors that focus on digital literacy, content creation, and cultural communication. Fostering collaboration between younger and senior instructors is crucial to ensure both continuity of values and innovation in teaching methods. Providing spaces for ethical reflection and dialogue around digital practice should also be integrated into dance education.

For researchers and academics, future studies could incorporate the perspectives of students or audiences to assess how cultural content is received and interpreted. Employing digital ethnography or algorithmic analysis may also enrich the understanding of platform dynamics such as those found on TikTok.

For policymakers and cultural authorities, there is a need to provide infrastructure and regulatory support aimed at strengthening digital literacy within local arts communities. Incorporating social media-based approaches into national cultural preservation programs could enhance outreach and engagement, especially among younger generations.

In sum, the findings of this research contribute to a broader understanding of how traditional arts are transforming in the digital age. They highlight opportunities for developing preservation strategies grounded in both social interaction and digital technology. Traditional dance, in this regard, is not only being preserved but also reimaged—its values evolving through digital connectivity and algorithmic interaction.

References

- Ambarwati, Dinda Dewi, Usrek Tani Utina, Jurusan Pendidikan, Seni Drama, Fakultas Bahasa, and Negeri Semarang. 2022. "JURNAL SENI TARI Pengaruh Dance Challenge Pada Media Sosial TikTok Terhadap Minat Menari Remaja Kabupaten Blora Di Era Pandemi Covid-19." (11):22–35.
- Anne Kaun. 2014. "A Review of Jose van Dijck: Culture of Connectivity: A Critical History of Social Media." *MedieKultur* 56:195–97. doi: 10.7146/mediekultur. v30i56.16314.
- Bejakovi, Predrag. 2020. "The Importance of Digital Literacy on the Labour Market." 42(4):921–32. doi: 10.1108/ER-07-2019-0274.
- Clarke, Victoria, and Virginia Braun. 2012. "Thematic Coding and Analysis." *The SAGE Encyclopedia of Qualitative Research Methods*. doi: 10.4135/9781412963909.n451.
- Daychak, Ashley. 2023. "The Pros and Cons of Social Media for Dancers." *Performing Dance Arts*. Retrieved February 18, 2025 (<https://www.performingdancearts.ca/tips-young-young-dancers-overcome-challenges/>).

- Erstad, Ola. 2010. "Educating the Digital Generation." *Nordic Journal of Digital Literacy* 5(1):56–71. doi: 10.18261/issn1891-943x-2010-01-05.
- Griffith, Frances J., Catherine H. Stein, James E. Hoag, and Kayla N. Gay. 2021. "#MentalHealthArt: How Instagram Artists Promote Mental Health Awareness Online." *Public Health* 194:67–74. doi: 10.1016/J.PUHE.2021.02.006.
- Puji, Santoso. 2016. "Konstruksi Sosial Media Massa Puji Santoso Dosen Komunikasi Fakultas Ilmu Sosial Dan Ilmu Politik Universitas Muhammadiyah Sumatera Utara." *Al-Balagh* 1(1):34.
- Reddy, Pritika, Kaylash Chaudhary, and Shamina Hussein. 2023. "A Digital Literacy Model to Narrow the Digital Literacy Skills Gap." *Heliyon* 9(4).
- Sabili, Muhammad Raihan, Balqis Putri Hidayatullah, Desi Indrawati, and Nana Sofiani. 2023. "The Effectiveness of Digital Platform in Preserving Traditional Dances of Indonesia: Implementation of Design Thinking Process in TARI (Traditional Art of Indonesia)." 01098.
- statista. 2025. "Countries with the Largest TikTok Audience as of February 2025 (in Millions)." Retrieved (<https://www.statista.com/statistics/1299807/number-of-monthly-unique-tiktok-users/>).
- Wohn, Donghee Yvette, and Brian J. Bowe. 2016. "Crystallization: How Social Media Facilitates Social Construction of Reality." *CSCW 2014* (April). doi: 10.1145/2556420.2556509.
- Yin, Robert K. 2018. *Case Study Research and Applications Design and Methods*. 6th Editio. SAGE Publications, Inc.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).