

Mapping influential CLIL research in English language teaching: a bibliometric SWOT analysis

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ABSTRACT

Content and language integrated learning (CLIL) has gained increasing attention in English language teaching (ELT); however, existing reviews often describe trends without critically examining both research impact and developmental challenges. This study addresses this gap by investigating the question: what directions and challenges characterize influential CLIL research in ELT? An integrative approach combining document-level bibliometric performance analysis and strengths, weaknesses, opportunities and threats (SWOT) analysis was employed. Using the Scopus database, the ten most-cited CLIL-related studies published between 2021 and 2025 were identified and systematically analyzed. The findings indicate that influential CLIL scholarship centers on pedagogical scaffolding, teacher cognition, learner motivation, and technology-enhanced learning environments. At the same time, recurring challenges include role ambiguity between content and language teachers, policy-practice misalignment in English-medium instruction (EMI) contexts, and limited longitudinal evidence of language outcomes. The study concludes that while CLIL research is increasingly shaped by digital innovation, sustainable implementation depends on pedagogical clarity, teacher preparation, and institutional alignment. By integrating bibliometric evidence with critical qualitative synthesis, this study provides theoretical and practical insights to guide future research, teacher education, and policy development aligned with sustainable development goal 4 (quality education).

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1. INTRODUCTION

Content and language integrated learning (CLIL) has gained growing prominence in English language teaching (ELT) as a pedagogical approach that integrates subject-matter instruction with the concurrent development of a second or foreign language [1]. Rather than positioning language learning as a discrete subject, CLIL frames English as a vehicle for meaning-making, problem-solving, and disciplinary knowledge construction [2]. This dual-focused approach has been increasingly implemented across primary, secondary, and tertiary education, particularly within multilingual and internationalized educational contexts [3].

The significance of CLIL lies in its capacity to address both linguistic and academic demands simultaneously within a unified instructional framework. By situating language learning within authentic

subject content, CLIL fosters higher levels of cognitive engagement, supports the development of academic discourse, and facilitates exposure to subject-specific language practices [4]. In ELT settings, CLIL has frequently been linked to enhanced learner motivation, improved communicative competence, and stronger connections between language learning and real-world applications [5]. Furthermore, CLIL aligns with global educational priorities such as internationalization, employability, and the development of 21st-century skills, contributing to its appeal as a model for curricular innovation in ELT [6].

Despite these potential benefits, implementing CLIL presents a range of challenges. Teachers commonly report difficulties in maintaining an effective balance between content and language objectives, particularly when institutional priorities favor subject mastery over language development [7]. Ongoing role ambiguity between content specialists and language teachers remains a concern, especially in CLIL-related English-medium instruction (EMI) contexts [8]. Additionally, limited teacher preparation, insufficient instructional resources, and inconsistent policy support can constrain effective classroom practice [9]. Learners may also experience cognitive overload when linguistic demands exceed their current proficiency levels [10]. Collectively, these challenges underscore the need for clearer pedagogical frameworks, stronger empirical grounding, and more systematic professional development to ensure that CLIL fulfils its intended promise in ELT contexts [11]. Guided by these gaps, this study addresses the following scientific question: what research directions and persistent challenges characterize highly influential CLIL studies in ELT? By examining highly cited publications through bibliometric and strengths, weaknesses, opportunities and threats (SWOT) analyses, the study aims to provide an evidence-informed interpretation of the field's current trajectory and future needs.

2. METHOD

This study employed an integrative analytical design that combined document-level performance analysis with a structured SWOT analytic approach to examine influential research on CLIL in ELT [12]. The first phase involved identifying the top 10 most-cited CLIL-related research articles in the Scopus database, using citation counts as indicators of scholarly influence and research visibility [13]. This procedure is commonly adopted in bibliometric and performance-based reviews in applied linguistics [1]. These highly cited documents were subsequently analyzed to identify their dominant research foci, methodological orientations, and principal scholarly contributions, following established document-level analytic practices in CLIL research synthesis [3]. The evidence supporting the study's conclusions derives from citation-based performance indicators combined with cross-study thematic synthesis, allowing both quantitative influence measurement and qualitative interpretive validation.

In the second phase, a SWOT analytic framework was applied to synthesize internal strengths and weaknesses alongside external opportunities and threats emerging across the selected studies [14]. Strengths and weaknesses were identified through recurring pedagogical trends, theoretical coherence, and methodological constraints reported in the literature, while opportunities and threats were inferred from broader institutional, policy-related, and contextual factors affecting CLIL implementation [11]. This combined bibliometric-SWOT approach enabled a systematic yet interpretive examination of both research impact and future developmental trajectories, offering a comprehensive methodological lens for evaluating the current state of CLIL research in ELT [6].

2.1. Search string

The inclusion criteria for the bibliometric search, as shown in Table 1, were carefully defined to ensure relevance, quality, and consistency in capturing influential CLIL research in ELT [15]. The Scopus database was selected for its comprehensive coverage of high-impact, peer-reviewed journals in education and applied linguistics [16]. The search was conducted across TITLE-ABS-KEY fields to maximize retrieval precision while maintaining conceptual relevance. Only research articles published between 2021 and 2025 were included to reflect recent scholarly developments in CLIL. To ensure linguistic and analytical consistency, only English-language publications were considered. In addition, all forms of open access articles were included to enhance transparency, accessibility, and replicability of the analysis.

The study selection process followed the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines to ensure transparency and methodological rigor in identifying relevant CLIL literature [17]. An initial 1,245 records were retrieved from the Scopus database during the identification stage. After screening by document type, 176 records were excluded as they were not research articles. A further 630 records were removed for falling outside the specified publication period. Subsequently, 439 full-text articles were assessed for eligibility, of which 190 articles were excluded due to language and open-access criteria. The final dataset comprised 249 studies that met all inclusion criteria and were deemed suitable for bibliometric and SWOT analyses, as illustrated in Figure 1.

Table 1. Inclusion criteria for bibliometric analysis

Scopus database	ALL
Time period	2021 to 2025
Search field	TITLE-ABS-KEY
Search keywords	("Content and language integrated learning" OR "CLIL") AND ("English")
Document types	Article
Language	English
Open access	All open access

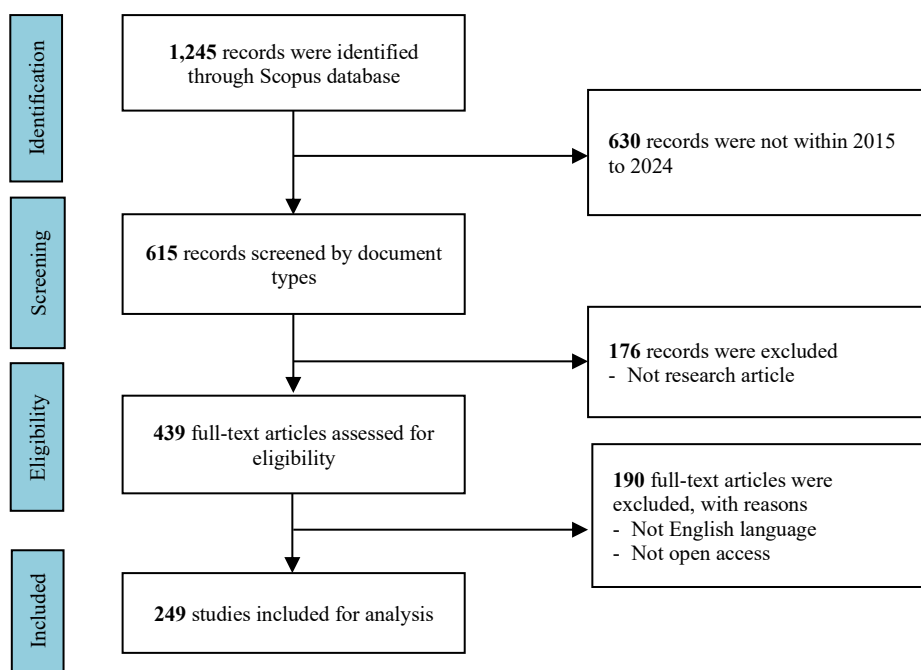


Figure 1. PRISMA flowchart

3. RESULTS AND DISCUSSION

3.1. Performance analysis

The analysis of the top 10 most-cited CLIL-related articles, as shown in Table 2, reveals several dominant themes that have shaped recent scholarship in ELT. The most highly cited work focuses on technology-enhanced CLIL, particularly the use of artificial intelligence (AI) chatbots and immersive digital tools, reflecting a growing emphasis on innovation and digital pedagogy in integrated learning contexts [18], [19]. Strong citation counts are also evident in studies examining pedagogical scaffolding and teacher cognition, highlighting the central role of instructional mediation in supporting content and language integration [20], [21].

Table 2. Top 10 most cited documents

No.	Author(s)	No. of citations
1.	Mageira <i>et al.</i> [18]	212
2.	Mahan [20]	95
3.	Block and Moncada-Comas [22]	95
4.	Moncada-Comas and Block [23]	71
5.	Villabona and Cenoz [21]	59
6.	Çelik and Ersanlı [19]	55
7.	Adipat [24]	51
8.	Iwaniec and Wang [25]	49
9.	Hennebry and Gao [26]	36
10.	Banegas and Beamud [27]	31

Another prominent strand centers on EMI and CLIL-ised EMI, where researchers critically examine lecturer identity, role ambiguity, and implementation challenges in higher education settings [22], [23]. Motivation-focused studies further indicate that learner agency and perceived academic value are key drivers of participation in EMI and CLIL programmes [25], [26]. Finally, the inclusion of teacher education research underscores the importance of professional preparation in sustaining CLIL practices [27]. Collectively, these

influential articles suggest that impactful CLIL research converges around pedagogy, technology integration, teacher roles, and learner motivation, while continuing to surface unresolved structural and instructional challenges.

The overlay visualization in Figure 2 reveals a clear temporal shift in the focus of CLIL research over recent years. Earlier studies concentrated on pedagogical foundations, particularly teacher scaffolding, content-language balance, and professional roles in CLIL and EMI contexts [20], [22]. More recent publications, represented by warmer colors, indicate growing attention to technology-enhanced CLIL, including AI-supported instruction, augmented reality (AR), and gamified learning environments [18], [19]. This trend suggests that CLIL research is progressively aligning with digital transformation agendas while building on established pedagogical principles.

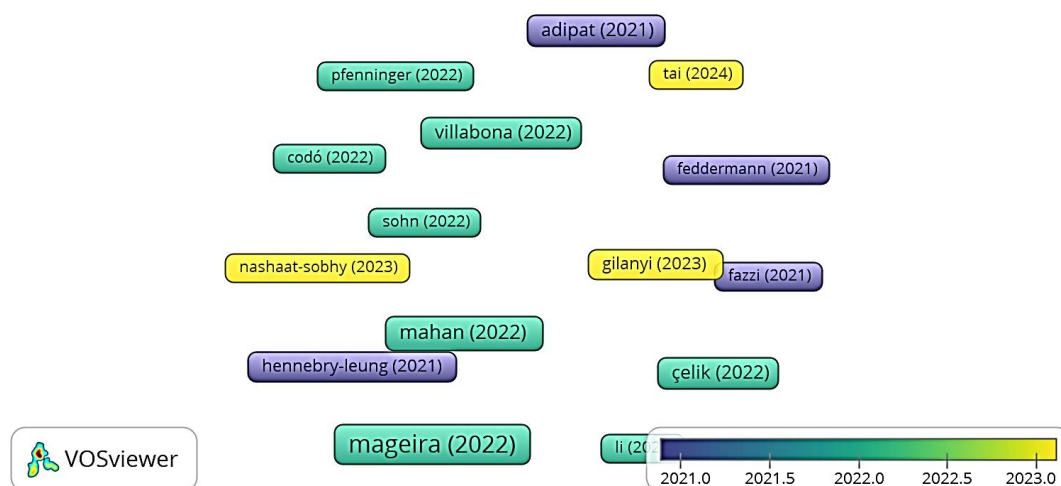


Figure 2. Overlay visualization (VOSviewer)

3.2. SWOT analysis

SWOT analysis enables the examination of internal attributes of the literature, namely its strengths and weaknesses, alongside external conditions that present opportunities and threats to the development of the field. By applying this framework to highly cited studies, the analysis moves beyond descriptive trends to uncover underlying pedagogical patterns, methodological limitations, and contextual challenges shaping CLIL implementation. This approach offers a holistic perspective that connects research impact with its practical and theoretical implications, thereby laying the foundation for the detailed SWOT subtopics, as shown in Table 3.

3.2.1. Strengths

a. Strong pedagogical foundations and scaffolding practices

A key strength of CLIL research lies in its robust pedagogical grounding, particularly in scaffolding and teacher-mediated learning. CLIL classrooms emphasize guided interaction, cognitive support, and gradual language release, allowing learners to access complex content without linguistic overload. Mahan [20] demonstrates how teachers' strategic scaffolding bridges disciplinary understanding and language development, reinforcing CLIL's alignment with sociocultural learning theory. Similarly, Villabona and Cenoz [21] highlight how balanced content-language integration supports meaningful learning rather than superficial language exposure. These pedagogical strengths position CLIL as more than a language-through-exposure approach, instead framing it as a deliberately designed instructional model.

b. Integration of digital and immersive technologies

Recent CLIL studies show strong innovation through technology integration, enhancing learner engagement and multimodal meaning-making. AI chatbots [18], AR, and gamified learning environments [19] have been shown to support content comprehension while sustaining learners' motivation and interaction. These tools allow CLIL to respond to contemporary digital learning expectations and personalize instructional support. Furthermore, technology-enhanced CLIL strengthens alignment with global digital education agendas and industry 4.0 imperatives. This technological adaptability strengthens CLIL's relevance across formal, higher education, and blended learning contexts.

3.2.2. Weaknesses

a. Role ambiguity between content and language teachers

A persistent weakness in CLIL and EMI research concerns the lack of clarity regarding professional roles. Studies reveal that content lecturers often resist identifying as language teachers, particularly in higher education EMI contexts [22]. This role ambiguity weakens systematic language support and undermines CLIL's dual-focus principle. Moncada-Comas and Block [23] further demonstrate that CLIL-ised EMI frequently prioritizes content delivery over language development. Without clear pedagogical responsibility and collaborative models between language and content specialists, CLIL risks becoming content-dominant rather than genuinely integrated.

b. Limited longitudinal and outcome-focused evidence

Many CLIL studies rely on short-term interventions, perception data, or small-scale qualitative designs, limiting claims about sustained language development. While studies report improved motivation and attitudes [19], [26], fewer examine long-term gains in academic language proficiency or disciplinary literacy. Additionally, self-reported teacher and student perspectives dominate the literature [21], reducing empirical robustness. This methodological limitation constrains CLIL's evidentiary strength, particularly when policymakers demand measurable outcomes to justify curriculum reform.

Table 3. SWOT matrix

Article	Focus of study	Strengths	Weaknesses	Opportunities	Threats
[18]	Design and application of AI chatbots to support CLIL instruction	Demonstrates innovative integration of AI to support both content and language learning; strong alignment with Industry 4.0 and EdTech trends	Limited empirical validation in authentic classrooms; learner language gains not longitudinally measured	Expansion into adaptive, personalized CLIL environments; scalable AI-assisted CLIL models	Overreliance on technology may marginalize pedagogical expertise; digital divide across contexts
[20]	Role of teacher scaffolding in CLIL classrooms	Strong theoretical grounding in sociocultural theory; clarifies pedagogical role of teachers in CLIL	Focuses primarily on teacher cognition rather than learner outcomes	Provides a framework for professional development and CLIL teacher training	Risk of being underutilized in exam-driven or content-heavy curricula
[22]	STEM lecturers' positioning in EMI contexts	Offers critical insight into identity tensions between content teaching and language responsibility	Does not propose concrete pedagogical solutions; limited classroom-level data	Opportunity to redefine collaborative models between content lecturers and ELT specialists	Continued resistance from content lecturers may undermine language development goals
[23]	Practical challenges in CLIL-ised EMI implementation	Reveals structural and ideological mismatches in EMI policies and classroom realities	Context-specific findings limit generalizability	Informs policy-level reform and clearer CLIL-EMI differentiation	Misalignment between policy rhetoric and institutional support structures
[21]	Teacher perspectives on content-language integration in CLIL	Balanced comparison of content-driven vs language-driven approaches; strong pedagogical relevance	Relies heavily on self-reported teacher data	Supports development of integrated CLIL pedagogy models	Persistent division between content and language priorities
[19]	Gamified CLIL using AR	Empirical evidence of improved achievement and attitudes; strong methodological design	Technology-focused intervention may not be sustainable in low-resource settings	Expansion into immersive and game-based CLIL innovations	Technical issues and novelty effects may reduce long-term impact
[24]	TPACK development through technology-enhanced CLIL	Integrates CLIL with teacher digital competence frameworks; strong relevance to teacher education	Limited exploration of student language proficiency outcomes	Supports scalable teacher training models for digital CLIL	Rapid technology changes may outpace teacher preparedness
[25]	Student motivations for enrolling in EMI programs	Provides learner-centered perspective often missing in CLIL/EMI literature	Focuses on motivation rather than actual language learning outcomes	Informs recruitment strategies and program design	Market-driven EMI expansion may dilute pedagogical quality
[26]	Relationship between medium of instruction and learner motivation	Strong longitudinal insight into motivational dynamics	Language proficiency development not directly measured	Supports motivation-sensitive CLIL/EMI curriculum design	Motivation may decline if academic difficulty outweighs perceived benefits
[27]	CLIL pre-service teacher education via duo ethnography	Rich qualitative insight into teacher identity and reflective practice	Small-scale qualitative design limits generalizability	Informs reflective, cross-cultural CLIL teacher education	Institutional constraints may limit adoption of reflective models

3.2.3. Opportunities

a. Teacher capacity building through TPACK and CLIL training

CLIL offers strong opportunities for structured teacher professional development, particularly through TPACK-oriented, technology-enhanced models. Adipat [24] shows that integrating CLIL with

TPACK strengthens teachers' instructional competence and digital readiness. Embedding CLIL into pre-service and in-service teacher education programs can address role ambiguity and implementation inconsistency. Moreover, reflective approaches in CLIL teacher education [27] support identity formation and pedagogical confidence. These developments position CLIL as a catalyst for holistic teacher capacity building rather than a stand-alone instructional method.

b. Learner-centered program design and motivation alignment

Learner motivation offers a key opportunity to strengthen CLIL and EMI implementation. Studies show that students enroll in EMI and CLIL programs for academic capital, employability, and global mobility [25]. Understanding these motivations enables institutions to design CLIL curricula that align linguistic support with learners' aspirations. Additionally, motivation-sensitive instructional design can mitigate disengagement when cognitive and linguistic demands increase [26]. Leveraging learner motivation allows CLIL to evolve from a policy-driven model into a responsive, student-centered educational approach.

3.2.4. Threats

a. Policy-practice misalignment in EMI-driven contexts

A significant threat to CLIL lies in its conflation with EMI at the policy level. EMI programs are often implemented for internationalization and market positioning rather than pedagogical coherence, resulting in inadequate language support structures [23]. This policy-practice gap risks reducing CLIL to English-only instruction without scaffolding or integration principles. When institutional mandates prioritize visibility over instructional quality, CLIL's pedagogical integrity is compromised, thereby weakening both language-learning outcomes and academic equity.

b. Technological dependence and contextual inequality

While technology enhances CLIL innovation, excessive reliance on digital tools presents systemic risks. AI, AR, and gamified platforms may not be accessible across all educational contexts, exacerbating inequalities between well-resourced and under-resourced institutions [18], [19]. Additionally, technology-driven CLIL risks overshadowing pedagogical intentionality if tools are adopted without instructional alignment. This dependence threatens CLIL's sustainability and inclusivity, particularly in contexts where infrastructure, teacher training, or digital literacy remains uneven.

3.3. Discussion

The combined evidence from document-level performance analysis and the SWOT synthesis provides a nuanced understanding of contemporary CLIL research in ELT. The prominence of highly cited studies on pedagogical scaffolding and teacher cognition confirms that effective CLIL remains strongly grounded in instructional mediation and sociocultural perspectives on learning [20], [21]. At the same time, the strong citation impact of technology-oriented studies signals a growing shift towards digitally enhanced CLIL models, particularly through AI-supported and immersive learning environments [18], [19].

However, the SWOT findings reveal that these strengths coexist with persistent challenges. Role ambiguity between content and language teachers and the blurring of boundaries between CLIL and EMI continue to undermine systematic language support, especially in higher education contexts [22], [23]. While opportunities exist for teacher capacity building through technology-enhanced and TPACK-oriented approaches [24], [28], their effectiveness depends on coherent institutional policies and sustained professional development [29], [30]. Thus, the findings align with Lap *et al.* [31], who argue that future CLIL advancement requires balancing innovation with pedagogical clarity and structural alignment.

Beyond identifying dominant themes, the findings suggest a transitional phase in CLIL scholarship in which pedagogical foundations remain stable while technological innovation increasingly shapes research priorities [32], [33]. This indicates that the evolution of CLIL is not a replacement of traditional pedagogy but an expansion of instructional possibilities through digital mediation [34], [35]. The coexistence of innovation and structural challenges further implies that successful CLIL implementation depends less on technological adoption alone and more on coherent pedagogical alignment among teachers, institutions, and policy frameworks [35], [36]. Consequently, future research should move beyond short-term intervention studies toward longitudinal and multi-context investigations capable of demonstrating sustained language and academic outcomes [37]. Such directions will strengthen the empirical credibility of CLIL and support evidence-informed educational reform.

This study contributes to CLIL theory by demonstrating that influential research continues to be anchored in pedagogical scaffolding, teacher mediation, and integrated content-language design, while increasingly incorporating digital and technology-enhanced perspectives [7], [38]. The findings reinforce sociocultural views of learning, in which language development is mediated through guided engagement with disciplinary content and collaborative instructional practices [11], [39]. At the same time, the analysis highlights a persistent conceptual gap resulting from the frequent overlap between CLIL and EMI,

particularly in higher education contexts [3], [40]. This underscores the need for clearer theoretical differentiation and the development of more integrative models that explicitly connect pedagogy, technology, and policy dimensions in future CLIL research [6], [41].

From a practical perspective, the findings emphasize the importance of intentional instructional design in effective CLIL implementation. Educators and institutions should prioritize systematic scaffolding strategies and clearly defined language-support roles for both content and language teachers [42], [43]. Professional development initiatives should focus on strengthening pedagogical and digital competencies to support integrated teaching practices [11]. In addition, policymakers and programmed designers should ensure that CLIL and EMI initiatives are underpinned by adequate training, appropriate resource allocation, and coherent assessment alignment [9], [44]. Addressing these interrelated factors can enhance the sustainability, effectiveness, and educational equity of CLIL practices across diverse learning contexts [10], [45].

Future studies may extend this work by examining longitudinal learner outcomes, cross-disciplinary teacher collaboration models, and context-sensitive digital CLIL implementations to enhance empirical and practical applicability across diverse educational contexts [46], [47]. Longitudinal investigations are particularly needed to determine whether improvements in motivation and engagement lead to sustained language proficiency and academic achievement [48], [49]. Research should also explore collaborative instructional models that integrate content and language teachers through coordinated planning and shared pedagogical responsibility [50], thereby addressing persistent role ambiguity in CLIL practice.

4. CONCLUSION

This study synthesized influential CLIL research in ELT by integrating document-level performance analysis with a structured analytical framework to examine key trends and challenges in the field. The findings indicate that highly cited studies consistently emphasize pedagogical scaffolding, teacher mediation, and, more recently, technology-enhanced instructional practices. Together, these strands highlight CLIL's potential to support meaningful language development through content-driven learning when integration is intentional and well supported. At the same time, persistent challenges were identified, including role ambiguity between content and language teachers, limited longitudinal evidence of learning outcomes, and policy-practice misalignment in EMI-oriented contexts.

By offering a consolidated view of impact and thematic patterns, this study contributes to a clearer understanding of CLIL's developmental trajectory. Importantly, the findings align with sustainable development goal 4 (quality education) by underscoring CLIL's capacity to promote inclusive and equitable learning through integrated language and content instruction. Ensuring pedagogical clarity, teacher preparedness, and contextual sensitivity will be essential for sustaining CLIL's educational value across diverse settings.

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Desmond Sandum		✓			✓		✓			✓		✓		✓
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Choiril Anwar		✓		✓		✓				✓	✓			

C : **C**onceptualization

M : **M**ethodology

So : **S**oftware

Va : **V**alidation

Fo : **F**ormal analysis

I : **I**nvestigation

R : **R**esources

D : **D**ata Curation

O : Writing - **O**riginal Draft

E : Writing - Review & **E**ditng

Vi : **V**isualization

Su : **S**upervision

P : **P**roject administration

Fu : **F**unding acquisition

CONFLICT OF INTEREST STATEMENT

The authors state no conflict of interest.

DATA AVAILABILITY

Data availability is not applicable to this paper as no new data were created or analyzed in this study.

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