



First-Year Students' Narratives on Generative AI-Based Feedback and Cognitive Engagement

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ABSTRACT

Background. The integration of Generative Artificial Intelligence (AI) in higher education has transformed how formative feedback is delivered, offering possibilities that are immediate, adaptive, and personalized. However, a critical gap persists in the literature: most studies have measured the effectiveness of AI-based feedback without examining how students actually experience and make meaning of it. This gap is especially pronounced among first-year university students in developing countries such as Indonesia, where the lived dimensions of AI-mediated learning remain largely unexplored.

Purpose. This study aims to explore first-year students' narratives on their experiences with Generative AI-based formative feedback and how these experiences shape their cognitive engagement.

Method. This study employs a qualitative approach using narrative inquiry. Twelve first-year students were purposively selected from 80 participants based on theoretical saturation criteria, providing rich reflective data on their interactions with Generative AI-based feedback. Data were analyzed through inductive thematic narrative analysis, identifying recurring patterns that illuminate how students construct meaning from their experiences and how those experiences shape their cognitive engagement.

Results. The findings indicate that students perceive AI-based feedback as a supportive and responsive learning companion that facilitates reflection, encourages independent learning, and promotes deeper engagement with learning materials. Students' narratives also highlight the importance of immediacy and personalization in feedback, which contribute to the development of critical thinking, self-regulation, and deep learning strategies.

Conclusion. This study emphasizes the importance of understanding AI-based learning not only through measurable outcomes but also through students' lived experiences. By foregrounding students' voices, this research provides insights into how AI-mediated feedback can support meaningful learning and enhance cognitive engagement. The findings offer practical implications for designing more adaptive and student-centered feedback practices in higher education.

KEYWORDS

Cognitive Engagement, First-Year Students, Formative Feedback, Generative AI, Narrative Inquiry

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INTRODUCTION

The rapid advancement of digital technologies, particularly Artificial Intelligence (AI), has fundamentally



transformed higher education practices, reshaping how teaching, learning, and formative feedback are conceptualized and delivered. Generative AI tools such as ChatGPT have introduced new possibilities for providing feedback that is immediate, adaptive, and personalized to individual learners' needs (Aithal & Maiya, 2023). While these developments have attracted considerable scholarly interest, a critical gap remains: existing research has predominantly measured outcomes without examining how students experience and interpret AI-based feedback in real learning contexts. In the Indonesian higher education landscape, where AI adoption is expanding but remains uneven and context-specific, this gap is particularly significant. Little is known about how Indonesian students especially those in their first year make sense of AI-mediated learning, raising fundamental questions about the experiential and interpretive dimensions of technology-enhanced feedback (Aithal & Maiya, 2023). In the Indonesian context, although the integration of AI in education has gradually expanded, its implementation remains uneven across institutions, raising critical questions about how students actually experience and respond to such technologies in real learning settings (Selwyn, 2021).

Cognitive engagement is widely recognized as a central dimension of meaningful learning, encompassing students' active involvement in processing information, critical thinking, and knowledge construction. Students with strong cognitive engagement tend to interact more deeply with learning materials and sustain higher levels of intellectual effort (Alam & Mohanty, 2024). Yet, fostering such engagement among first-year university students remains challenging, as this population must simultaneously navigate the transition from structured secondary schooling to the more autonomous demands of higher education (Alam & Mohanty, 2024). (Mulaudzi, 2023) (Hensby & Adewumi, 2024). These transitional challenges are particularly salient in Indonesia, where students in their first year often lack familiarity with autonomous academic work and technology-driven learning environments. This context underscores the need for instructional strategies that not only support learning outcomes but also address the deeper experiential dimensions of student engagement an area this study specifically targets.

Formative feedback has long been identified as a key pedagogical mechanism for enhancing learning, as it enables students to reflect on their performance and identify areas for improvement (Silver et al., 2023). With the emergence of Generative AI, feedback practices have evolved beyond traditional teacher-centered approaches, enabling more immediate, dialogic, and personalized interactions. Recent studies suggest that AI-based feedback can support motivation and engagement (Yildiz Durak & Onan, 2025). However, most of this body of research remains grounded in outcome-oriented paradigms that prioritize measurable effectiveness, often neglecting how students interpret and experience feedback in their learning journeys.

Existing studies on AI in education have predominantly employed quantitative methods, focusing on variables such as academic performance, satisfaction, or engagement scores derived from standardized instruments (Kandiko Howson & Matos, 2021). While these studies provide valuable empirical evidence, they offer limited insight into the subjective and interpretive dimensions of learning. In particular, there remains a lack of research that explores how students negotiate, construct, and assign meaning to their interactions with AI-based feedback. Moreover, research on Generative AI as a formative feedback tool is still emerging and has not been extensively examined in authentic classroom contexts, especially in developing countries such as Indonesia (Nurhayati et al., 2025). This indicates a clear need to move beyond effectiveness-driven approaches toward perspectives that capture the richness of students' lived experiences.

In response to these limitations, a narrative perspective offers a particularly well-suited analytical lens for examining cognitive engagement as an experiential and meaning-making process. Narrative inquiry is especially appropriate here because cognitive engagement is not merely observable behavior but a dynamic, internally constructed state shaped by how learners interpret, reflect on, and assign meaning to their interactions with learning tools. By accessing students' voices through their personal stories and reflective accounts, narrative inquiry illuminates not only what students do with AI-based feedback but why and how those interactions become educationally meaningful. Rather than asking whether AI is effective, this approach asks how students experience AI, how they interpret its role in their learning, and in what ways those experiences actively shape their cognitive engagement. This represents both a methodological departure from prior quantitative research and a conceptual reorientation toward student-centered, experiential understandings of learning.

Accordingly, this study aims to explore first-year students' narratives on their experiences with Generative AI-based formative feedback and to examine how those experiences shape their cognitive engagement. The specific research gap addressed is the near-complete absence of narrative-based, experiential investigations into AI-mediated feedback in Indonesian higher education. By foregrounding students' lived voices, this research contributes a novel interpretive framework to existing scholarship one that positions cognitive engagement not as a product to be measured, but as a lived process to be understood. The novelty of this study is threefold: it is the first to apply narrative inquiry to examine first-year students' experiences with Generative AI-based feedback in Indonesia; it reconceptualizes cognitive engagement as an experiential construct rather than a measurable outcome; and it foregrounds students' subjective meaning-making as a legitimate site of scholarly inquiry. The findings are expected to provide both theoretical contributions to the discourse on AI-mediated cognitive engagement and practical implications for designing more adaptive, timely, and student-centered feedback systems in Indonesian and broader higher education contexts.

RESEARCH METHODOLOGY

This study employed a qualitative approach using narrative inquiry to explore first-year university students' lived experiences in interacting with Generative AI-based formative feedback. Narrative inquiry was selected because it enables an in-depth understanding of how individuals construct meaning from their experiences and how these experiences shape their learning processes (Adhikari, 2021). Rather than focusing on measuring effectiveness, this study emphasizes students' personal stories, interpretations, and reflections, allowing cognitive engagement to be understood as an experiential and meaning-making process (Popa, 2022).

The study was conducted at a higher education institution in South Sulawesi, Indonesia, involving first-year university students enrolled in courses that required regular assignments and feedback. Initially, a total of 80 students participated in learning activities involving Generative AI based feedback. From this initial cohort, 12 participants were purposively selected for in-depth narrative analysis based on theoretical saturation principles. In narrative inquiry, the adequacy of sample size is determined by the depth and richness of data rather than quantity; prior studies in comparable qualitative traditions have demonstrated that 10–15 purposively chosen participants typically suffice to achieve thematic saturation when reflective narratives are the primary data source (Ahmad & Wilkins, 2025). Selection continued until recurring patterns no longer produced new thematic insights, confirming that data saturation had been reached. Purposive sampling enabled identification of individuals who could provide rich and meaningful experiential accounts (Ahmad & Wilkins, 2025). The selection criteria included first-year students actively enrolled in undergraduate

programs, those who had experience using Generative AI tools such as ChatGPT for receiving feedback, those who had completed at least two assignments using AI-based feedback, and those willing to share reflective accounts of their learning experiences. To capture variation in experiences, the participants were categorized into three groups consisting of students with frequent, moderate, and limited use of AI-based feedback, with four students in each category.

Data were primarily generated through students' reflective writing, which is widely used in narrative research to capture personal experiences and meaning-making processes (M. S. Alam et al., 2025). Participants were asked to describe their experiences when interacting with AI-based feedback, focusing on how they perceived the feedback, how they utilized it in completing academic tasks, and how it influenced their understanding and engagement. To support deeper reflection without over-directing participants' responses, they were provided with a limited number of deliberately broad, non-prescriptive open-ended prompts. These prompts invited participants to narrate their experiences in their own words rather than respond to evaluative questions, thereby ensuring the narratives reflected students' authentic meaning-making. Participants were encouraged to articulate their experiences in narrative form rather than brief or structured responses (Garcia-Varela et al., 2025). The data collection process was conducted over several weeks to allow participants to reflect on multiple learning experiences.

The data were analyzed using an inductive thematic narrative analysis approach to identify patterns and meanings within students' experiences (Mesa Freydell et al., 2022). The analytical process was iterative and multi-phase. Initial immersive reading of all narratives established deep familiarity with the data. In the second phase, meaningful statements and experiential descriptions were inductively coded using open coding, without imposing prior theoretical categories. These initial codes were then systematically grouped into focused codes through constant comparison. In the third phase, focused codes were organized into thematic categories representing the dimensions of cognitive engagement examined: critical thinking, self-regulation, learning persistence, and deep learning strategies. Coding was conducted manually by the primary researcher, with an independent review by a second researcher to strengthen confirmability, and discrepancies were resolved through discussion. The final stage involved interpretive synthesis, examining how students constructed meaning from their experiences and how those meanings aligned with cognitive engagement theory (Li & Lajoie, 2022). This process enabled a deeper understanding of students' lived experiences beyond surface-level descriptions.

To ensure the trustworthiness of the findings in accordance with Lincoln and Guba's (1985) criteria for qualitative rigor, several strategies were systematically employed (Kakar et al., 2023). Credibility was established through prolonged engagement, as participants submitted multiple reflective accounts over several weeks, allowing consistent patterns to emerge. Dependability was addressed through the systematic, iterative coding procedure, ensuring analytical transparency and replicability. Confirmability was strengthened through independent peer review of coded transcripts, with discrepancies resolved through researcher discussion. Transferability was enhanced through thick description providing detailed contextual accounts that enable readers to judge the relevance of findings to other settings. Member checking was conducted by allowing participants to review preliminary interpretations and confirm their accuracy.

Ethical considerations were carefully addressed throughout the study. All participants were informed about the purpose of the research and voluntarily agreed to participate. Confidentiality and anonymity were maintained by assigning pseudonyms to participants. Participants were also informed of their right to withdraw from the study at any stage without any consequences (Dahal, 2024).

RESULT AND DISCUSSION

Cognitive Engagement Through Students' Narratives

The empirical findings of this study reveal that first-year students consistently experienced Generative AI-based formative feedback as a meaningful and responsive learning companion that actively supported their cognitive engagement. Across the 12 participants' reflective narratives, a recurring pattern emerged: students reported that AI-based feedback provided immediacy, personalization, and continuous availability qualities that directly influenced how they engaged with their academic tasks. Students became more reflective and analytical in approaching their work, describing iterative cycles of receiving feedback, revising, and re-engaging with learning materials. Unlike traditional instructor-led feedback, which students experienced as delayed and often general, AI-based feedback was perceived as immediate and task-specific, enabling students to act on guidance while the learning moment was still fresh. This pattern indicates that cognitive engagement, as students experienced it, was not simply activated by AI but was constructed through sustained interaction with it. For example, one participant expressed: *"When using AI, it feels like I immediately know where my mistakes are, so I start thinking again and try to fix them by myself."* (M3, 12 January 2026). Another participant stated: *"Usually, when lecturers give feedback, we have to wait a long time, but with AI it's very fast, so I feel more motivated to revise right away."* (M7, 18 January 2026).

These empirical patterns carry significant theoretical weight. The students' narratives illuminate the immediacy of AI-based feedback as a catalyst for ongoing cognitive activity students were not passive recipients but active participants engaged in continuous cycles of reflection, revision, and self-correction. This is theoretically consistent with cognitive engagement as active, sustained participation in learning processes (Li & Lajoie, 2022). While previous studies (DHIB, 2025) have focused on engagement as a measurable construct, this study highlights how engagement is experienced and constructed by students. This finding represents a key novelty, as it shifts the focus from effectiveness to lived experience.

From a theoretical perspective, the students' experiences lend important empirical support to the view that cognitive engagement is multidimensional and context-dependent (Xie et al., 2024). The critical contribution of this study lies in revealing the experiential dimension of cognitive engagement how students in an Indonesian context actively construct and negotiate their engagement through AI feedback interactions. A key practical implication is that AI-based feedback should be embedded as an integral cognitive scaffold rather than a supplementary correction tool. Importantly, this positive impact may not be universal; students lacking digital confidence or preferring dialogic human interaction may benefit less, pointing to the need for differentiated implementation strategies.

Development of Critical Thinking

The findings indicate that AI-based feedback contributes significantly to the development of students' critical thinking. Students reported that AI feedback encourages them to analyze their errors, compare alternative responses, and reflect more deeply on learning materials. This suggests that critical thinking develops through interaction with feedback rather than through direct instruction alone. Students became more aware of their reasoning processes and more active in evaluating the quality of their work. This indicates that AI plays a role as a cognitive scaffold that supports higher-order thinking. One participant described: *"Sometimes the AI explains why my answer is not correct, so I start thinking again and try to find a different way."* (M5, 15 January 2026). Another participant added: *"I often recheck my answers because the AI gives different alternatives that make me think more."* (M1, 10 January 2026).

These findings demonstrate that AI-based feedback catalyzes analytical and evaluative thinking by positioning students as active reasoners rather than passive learners. This is theoretically consistent with constructivist learning theory, which holds that meaningful understanding emerges through active knowledge construction in interaction with the environment (Al Abri et al., 2024). Song et al. (2025) demonstrated measurable improvements in critical thinking through digital project-based learning; however, their investigation focused on post-intervention outcomes rather than the phenomenological experience of critical thinking development. The present study extends this by

revealing how students actively experienced and narrated the sharpening of their analytical reasoning through AI feedback illuminating the internal cognitive processes through which this development occurs.

From a theoretical standpoint, Ismaniati et al. (2025) argues that critical thinking develops through reflective and inquiry-based processes, a position that is strongly consistent with the patterns observed in this study. What students described was not merely an improved response rate to feedback, but a qualitative shift in how they engaged with their own reasoning a form of metacognitive activation that aligns with reflective approaches to critical thinking. In the Indonesian context, Zou et al. (2023) found that digital feedback enhances analytical thinking tendencies through peer and self-feedback mechanisms. However, their study focused on measurable behavioral outcomes and did not capture the internal reasoning processes that students experience. This study addresses that gap by foregrounding how students interpret, question, and engage with AI feedback at a cognitive level. The specific novelty here is demonstrating that critical thinking development through AI feedback is not merely an outcome to be measured post-hoc, but an experiential process that students actively undergo during each feedback interaction. A practical implication for educators is that AI-based feedback tools should be designed to require students to explain or justify their revisions—a simple scaffolding mechanism that could further deepen reflective and critical thinking.

Enhancement of Self-Regulation

Another important finding is that AI-based feedback enhances students' self-regulation. Students reported becoming more aware of their learning progress and more responsible for improving their work. The availability of immediate feedback allows them to independently identify weaknesses and revise their work without relying on instructors. This reflects the development of metacognitive awareness and independent learning behavior. Students also indicated that they became more confident in managing their own learning process. One participant stated: *"After seeing the feedback from AI, I immediately know which parts need improvement, so I don't have to wait for the lecturer."* (M9, 20 January 2026). Another participant explained: *"I feel more independent because I can learn from the feedback without always asking the lecturer."* (M2, 11 January 2026).

These empirical observations are theoretically grounded in self-regulated learning (SRL) theory, which conceptualizes effective learners as those who set goals, select appropriate strategies, monitor their progress, and adjust their behavior based on feedback (Hamzah et al., 2023). AI-based feedback supports this process by providing timely, specific, and continuously accessible input that enables students to engage in the monitor-evaluate-adjust cycle central to SRL frameworks. Borgstede and Scholz (2021) provide complementary quantitative support for this link, though their study did not access the experiential dimension that narrative inquiry captures. In the Indonesian context, Monib et al. (2025) similarly found that ChatGPT enhances learner autonomy, but their investigation did not delve into the phenomenological dimensions of how students experienced that development.

The theoretical novelty of this finding lies in demonstrating that self-regulation is not a static capacity that students either possess or lack, but a dynamic process actively shaped through iterative interaction with AI-based feedback. Students developed self-regulatory competencies incrementally each feedback cycle building their metacognitive repertoire and reinforcing habits of self-monitoring. This advances SRL theory beyond static skill acquisition toward a developmental, experience-based conception. Practically, educators should introduce AI-feedback integration with progressive autonomy in mind—beginning with more guided engagement and gradually transferring responsibility to students as their self-regulatory competence develops.

Increased Learning Persistence

A further significant empirical finding concerns students' sustained effort and persistence in learning. Students' narratives revealed that the affective dimensions of interacting with AI-based feedback—particularly the reduction of frustration and the experience of feeling continuously supported—played a meaningful role in motivating them to persist through challenging tasks.

Students described persistence not merely as a behavioral outcome but as an emotionally situated experience: they continued working not because they were required to, but because the responsiveness of AI feedback made continued effort feel worthwhile and achievable. This suggests that AI-based feedback operates on both cognitive and affective registers, lowering the psychological barriers associated with failure and revision. One participant shared: *"Because the feedback is fast, I feel motivated to keep improving my assignment until it gets better."* (M6, 16 January 2026). Another participant mentioned: *"Usually, when something is difficult, I just stop, but with AI I try again because there is support."* (M10, 22 January 2026).

These findings are theoretically grounded in motivational frameworks and feedback research. The literature on continuous performance feedback Giamos et al. (2024) highlights that feedback content and source significantly influence motivation to improve performance and task engagement. AI-based feedback, as evidenced in students' narratives, provided both cognitive (clarifying what to improve) and emotional (creating a sense of support and forward momentum) functions that together sustained students' persistence. This dual function distinguishes AI-based feedback from traditional forms. Previous studies Younas et al. (2025) have documented the impact of emotional learning on student behavior and resilience, but their structural equation approaches focused on quantifiable indicators. The present study extends this understanding by locating persistence within students' subjective, emotionally inflected experiences of learning revealing the specific affective mechanisms through which AI feedback generates sustained engagement.

The theoretical novelty of this finding lies in revealing that learning persistence is not solely a function of cognitive capacity or task difficulty, but is profoundly shaped by experiential and emotional factors that AI-based feedback uniquely addresses. Students' narratives make visible the affective substrate of persistence demonstrating that the experience of feeling heard, supported, and guided creates the motivational conditions under which first-year students choose to persist rather than disengage. In the Indonesian context, Lin (2025) investigated the psycho-emotional dimensions of technology-enhanced language learning, finding links between digital tool efficacy and motivational engagement, but did not examine how specific feedback modalities generate affective persistence. The present study fills this gap by providing narrative-level evidence of the emotional mechanisms underlying persistence in AI-supported academic contexts. Practically, this suggests that the design of AI-based feedback should attend not only to its informational accuracy but to its tone, pacing, and encouragement elements that shape students' emotional experience of being supported in learning.

Development of Deep Learning Strategies

The empirical findings also indicate that AI-based feedback promoted deep learning strategies approaches characterized by conceptual understanding, knowledge integration, and application rather than surface memorization. Students' narratives showed that AI feedback consistently pushed them toward deeper engagement: they sought to understand not just the correct answer but the underlying principles, and described making connections between ideas across different topics and contexts. This qualitative shift from performing tasks to understanding them is a hallmark of deep learning and distinguishes the present findings from behaviorally oriented studies that report improved performance without examining the cognitive experience underlying it. One participant explained: *"AI sometimes explains things in detail, so I understand the concept better, not just memorize it."* (M4, 13 January 2026). Another participant stated: *"I understand the connection between topics better because AI explains things more broadly."* (M8, 19 January 2026).

These findings align with deep learning theory, which emphasizes conceptual understanding and knowledge integration (Sánchez-Peña et al., 2023). Banerjee & Zlatkin-Troitschanskaia (2021) documented that narrative and affective dimensions of learning contribute to deeper conceptual engagement, but their analysis was concerned with the gap between knowledge and belief rather than with AI-mediated interactions. The present study builds on this theoretical tradition while extending it into the emerging domain of Generative AI feedback, providing the first narrative examination of

how deep learning strategies develop through AI-mediated feedback in an Indonesian higher education context.

The theoretical novelty of this finding is significant: it repositions deep learning not as an inherent student characteristic or a curriculum design feature but as a meaning-making process actively constructed through dialogic interaction with AI-based feedback. Students were not passive beneficiaries of well-designed prompts; they were active co-constructors of understanding, using AI feedback as a catalyst for conceptual exploration and knowledge integration. In the Indonesian context, Reyes & Villanueva (2024) demonstrated that narrative-based concept representations can foster visual cognition and conceptual understanding, though their focus was on instructor-designed narrative tools rather than AI-generated feedback. The present study extends this work by showing that AI-based feedback can naturally produce a similar narrative quality providing contextualized, elaborated explanations that guide students toward deeper conceptual engagement. Practically, instructors should consider designing AI-feedback prompts that explicitly require students to articulate connections between concepts and apply knowledge across contexts, leveraging AI's explanatory capacity to actively foster deep learning.

CONCLUSION

This study provides compelling evidence that Generative AI-based formative feedback plays a substantive and multidimensional role in shaping first-year students' cognitive engagement in Indonesian higher education. Across five thematic dimensions active cognitive engagement, critical thinking development, self-regulation, learning persistence, and deep learning strategies students consistently reported that interactions with AI-based feedback catalyzed higher-order cognitive processes, supported metacognitive development, and created affective conditions conducive to sustained learning effort. Rather than functioning merely as a correction tool, AI-based feedback was experienced as an interactive and responsive learning companion that positioned students as active participants in their own learning. The central theoretical claim advanced by this study is that cognitive engagement, when examined through a narrative lens, reveals itself not as an observable outcome to be measured but as a dynamic, experientially constructed process that unfolds through iterative feedback interactions.

This study addresses a critical and previously underexamined gap: the near-complete absence of narrative-based, experiential investigations into how first-year students in Indonesia make meaning of AI-mediated feedback interactions. By foregrounding students' voices and adopting narrative inquiry as its epistemological framework, this research makes a dual contribution. Theoretically, it advances an experiential conceptualization of cognitive engagement that transcends behaviorally oriented frameworks, positioning the learning process itself not just its outcomes as the appropriate unit of scholarly analysis. Methodologically, it demonstrates the unique generative capacity of narrative inquiry for revealing the internal, meaning-making dimensions of technology-enhanced learning that quantitative instruments cannot access. The findings extend prior work on AI in education by demonstrating not only that AI-based feedback can enhance learning processes, but how and through what experiential pathways those enhancements occur.

The practical implications of these findings are substantial. For educators, the evidence supports the intentional integration of AI-based feedback as a core pedagogical strategy particularly in first-year courses where students are navigating significant transitions in academic expectations and learning autonomy. Institutions should invest not merely in access to AI tools but in pedagogically informed implementation frameworks that scaffold students' engagement with feedback, encourage reflective processing, and progressively develop self-regulatory competence. AI-feedback design should also attend to the affective dimensions of the student experience, recognizing that tone,

responsiveness, and encouragement are not incidental but integral to the feedback's capacity to sustain motivation and persistence.

This study is not without limitations. The relatively small sample size (12 participants) and single-institution context necessarily restrict the transferability of findings to other educational settings. While purposive selection and data saturation are methodologically appropriate for narrative inquiry, future research should extend this investigation to larger, multi-institutional samples across diverse regional and cultural contexts within Indonesian higher education and beyond. Future studies combining narrative inquiry with observational or mixed-methods designs could generate richer accounts of AI-mediated learning that account for the full range of contextual factors mediating cognitive engagement.

DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this manuscript, the author(s) utilized language support tools to assist in improving sentence structure, clarity of expression, and consistency of academic language. The author(s) have thoroughly reviewed and revised the content and take full responsibility for the accuracy, originality, and integrity of the final publication.

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AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Data curation; Investigation; Writing – original draft.

Author 2: Conceptualization; Methodology; Validation; Writing – review and editing.

Author 3: Formal analysis; Investigation.

Author 4: Supervision; Validation.

Author 5: Resources; Data curation.

Author 6: Visualization; Writing – review and editing.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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