Editorial of the Spring 2026 Issue TR 64, Vol 18 No 2

Rafael Alberto Méndez-Romero, Ph.D.

School of Sciences and Engineering, Universidad del Rosario, Colombia

rafael.mendez@urosario.edu.co

This issue of the *Mathematics Teaching Research Journal* represents a rigorous and thoughtfully curated contribution to the field of contemporary mathematics education. The fifteen studies brought together here do more than present empirical findings or theoretical developments; when read as a whole, they delineate a landscape of concerns that are currently central to the field: the nature of mathematical reasoning and its teaching, the persistent tension between abstraction and contextualization, the design of pedagogical experiences that foster deep understanding and meaningful participation, and the trajectories of those who inhabit the field as learners, teachers, and researchers.

Taken collectively, these contributions portray a field that is not only expanding its empirical and theoretical horizons, but also engaging in a necessary process of self-examination. Mathematics education, as it emerges from this issue, is no longer confined to questions of content delivery or instructional efficiency. Instead, it is approached as a domain in which knowledge is constructed through interaction, mediated by tools and representations, shaped by cultural and institutional conditions, and experienced in deeply situated ways. This repositioning is not trivial. It invites us to reconsider what counts as mathematical understanding, how such understanding is legitimized, and whose voices and experiences are made visible within educational practice.

In a global context where mathematics education is increasingly questioned in terms of its relevance, its capacity to generate meaning, and its role in shaping critically engaged citizens, this *issue* offers a nuanced and well-grounded account of how different research communities are responding to these challenges. Across the contributions, one can identify a sustained movement away from transmissive models of teaching toward perspectives that foreground reasoning, sense-making, and participation. Learning mathematics is thus reframed as a process that is inherently relational, mediated, and context-dependent, where cognitive development cannot be disentangled from affective, cultural, and social dimensions.

At the same time, the studies gathered here do not obscure the complexity of this shift. On the contrary, they bring into focus a set of enduring tensions that continue to shape the field. Among them, the challenge of supporting learners in moving from intuitive forms of thinking toward formal reasoning; the difficulty of reconciling the abstract nature of mathematics with the need for

meaningful engagement; and the ongoing demand to design pedagogical environments that are both intellectually rigorous and responsive to diversity. These are not peripheral issues. They sit at the core of what it means to teach and learn mathematics today, and they require approaches that are as multifaceted as the problems themselves.

The organization of this *issue* follows an editorial logic that seeks to make these conversations visible, not as isolated themes, but as interconnected domains in which the articles engage with one another, complement one another, and, at times, unsettle established assumptions. What emerges is not a linear narrative, but a constellation of perspectives that, when read together, offer a richer and more layered understanding of the field. In this sense, the issue invites the reader to move beyond a fragmented engagement with individual studies and to consider instead how these contributions, in their diversity, collectively advance the ongoing reconfiguration of mathematics education as a dynamic, evolving, and deeply situated field of inquiry and practice.

Reasoning, Proof, and Representational Transitions

The issue opens with a set of contributions that address one of the most foundational concerns in mathematics education: the development of mathematical reasoning, particularly in relation to proof and transitions across representational registers. This focus is not merely technical; it speaks to how mathematical knowledge is constituted in the classroom and to the conditions under which students can meaningfully engage in disciplinary practices.

The article *"GeoGebra as an Epistemic Scaffold for Reasoning and Proof: Designing Instruction for Secondary Geometry Based on the Van Hiele Framework"* by Scristia, Tatang Herman, Kusnandi, and Jarnawi Afgani Dahlan offers a conceptually robust integration of the Van Hiele model, dynamic geometry technology, and instructional design. It demonstrates how tools such as GeoGebra can function as epistemic mediators, supporting students in moving from visual and intuitive forms of thinking toward more formal deductive structures, thereby addressing a well-documented gap in the literature.

Closely related to this concern, *"Exploring Pre-service Mathematics Teachers' Challenges in Understanding Intuition and Applying Scaffolding in Geometric Proofs"* by Sugi Hartono, Tatag Yuli Eko Siswono, Rooselyna Ekawati, and Farah Aisyah Nafidiastri examines the challenges that pre-service teachers encounter when attempting to reconcile intuition with formal proof. The study provides detailed evidence of the persistence of inductive reasoning in contexts that require formalization, and highlights how carefully designed scaffolding strategies can support cognitive restructuring.

The article *"Developing Adaptive Reasoning in Teacher Preparation: Elementary Pre-Service Teachers' Perspectives of Writing in Mathematics"* by Jessica M. McCormick introduces a significant shift by positioning writing as a constitutive practice of mathematical reasoning. From this perspective, adaptive reasoning is closely linked to the ability to explain, justify, and communicate mathematical ideas, with clear implications for teacher education.

Finally, *"The Role of Realistic Mathematics Education with Scaffolding Teaching Model in Enhancing Mathematical Representation Ability"* by Rizki Wahyu Yunian Putra, Sugeng Sutiarso, and Nurhanurawati extends the discussion to mathematical representation. The study shows how the integration of Realistic Mathematics Education with scaffolding strategies strengthens students' capacity to flexibly coordinate multiple forms of representation.

Taken together, these contributions point toward an understanding of reasoning as a practice that requires deliberate pedagogical mediation, structured opportunities for exploration, and sustained engagement with multiple forms of mathematical expression.

Context, Culture, and Meaningful Mathematization

The second set of contributions turns to the relationship between mathematics, context, and culture, addressing a longstanding tension between formalization and meaningful engagement. In recent scholarship, this tension has been increasingly examined in relation to the loss of meaning experienced by many learners in traditional mathematics classrooms.

The article *"Becoming (De)Contextualized Learners and Teachers of Mathematics: An Arts-Based Ethnodrama"* by Hem Lal Dhungana, Niroj Dahal, Indra Mani Shrestha, and Ruma Manandhar proposes a methodological approach that moves beyond conventional research paradigms. Through ethnodrama, the authors explore processes of (de)contextualization, situating mathematical learning within a cultural and narrative framework that challenges taken-for-granted assumptions.

In a complementary direction, *"Enhancing Student Engagement and Their Performance in Abstract Algebra Using Context Tasks"* by Sri Suryanti, Dwi Juniati, and Nia Wahyu Damayanti demonstrates that contextualization is not limited to early education. By focusing on abstract algebra, the study shows that context-based tasks can meaningfully impact both student engagement and performance, even in highly formal domains.

The article *"Integrating Ethnomathematics and GeoGebra: A Project-Based Learning Approach to Improve Mathematical Literacy"* by Siti Maysarah, Dian Armanto, and Sahat Saragih brings together cultural knowledge, technological tools, and project-based learning, offering an integrated approach to strengthening mathematical literacy.

Finally, *"Integration of Real-Life Scenarios in Mathematical Literacy Learning in Middle Schools in Parepare Indonesia"* by Marwati Abd. Malik, Mas'ud B, Ammang Latifa, and Rafi'ah Nur provides empirical evidence on the positive impact of incorporating real-life scenarios into mathematics instruction, highlighting gains in both conceptual understanding and student participation.

These contributions invite a reconsideration of contextualization not as an auxiliary pedagogical strategy, but as a foundational principle that reshapes the relationship between mathematical knowledge and lived experience.

Designing Pedagogies for Stronger Participation and Achievement

The third group of articles focuses on the design of pedagogical approaches aimed at strengthening learning, participation, and performance, while acknowledging the complexity of educational processes and the diversity of learners.

In *"Boosting Students' Abilities in Understanding, Application, and Reasoning of Numeracy: Didactical Differentiated Learning"*, Pariang Sonang Siregar, Hendra Sofyan, Nazurty, and Rosmiati presents differentiated instruction as an effective strategy for addressing classroom diversity, with positive effects across multiple dimensions of numeracy.

The article *"Comparison of the Effects of Explanatory Faded Worked Examples and Correct-Incorrect Worked Examples Methods on Sixth-Grade Students' Mathematics Performance"* by Özden Yavaş and Zeynep Çiğdem Özcan offers a comparative analysis grounded in cognitive load theory, showing how different approaches to worked examples lead to distinct learning outcomes.

In *"Transforming Confusion into Clarity: Employing the Feynman Technique to Overcome Mathematics Anxiety"*, Eric Machisi and Abdullah Kurudirek introduce a pedagogical approach that connects conceptual understanding with affective dimensions, demonstrating the importance of addressing mathematics anxiety as part of the learning process.

The article *"Enhancing Elementary Pre-service Teachers' STEM Integration Perceptions, Self-Efficacy, and Behavioral Intentions Through Experiential Learning in a Mathematics Methods Course"* by Jair J. Aguilar and Seokmin Kang extends the discussion to teacher education, showing how experiential learning influences preservice teachers' self-efficacy and their disposition toward interdisciplinary approaches such as STEM.

This set of contributions foregrounds pedagogy as a domain of informed decision-making, where instructional design directly shapes both the quality of learning experiences and student outcomes.

Title	Authors	Pages
Boosting Students' Abilities in Understanding, Application, and Reasoning of Numeracy: Didactical Differentiated Learning	Pariang Sonang Siregar, Hendra Sofyan, Nazurty, and Rosmiati	215-241
Comparison of the Effects of Explanatory Faded Worked Examples and Correct-Incorrect Worked Examples Methods on Sixth-Grade Students' Mathematics Performance	Özden Yavaş, Zeynep Çiğdem Özcan	242-267
Transforming Confusion into Clarity: Employing the Feynman Technique to Overcome Mathematics Anxiety	Eric Machisi, Abdullah Kurudirek	268-295
Enhancing Elementary Pre-service Teachers' STEM Integration Perceptions, Self-Efficacy, and Behavioral Intentions Through Experiential Learning in a Mathematics Methods Course	Jair J. Aguilar and Seokmin Kang	296-321

Profiles, Trajectories, and Professional Growth Across the Continuum

The issue concludes with a set of articles that broaden the perspective to include cognitive profiles, emerging competencies, and professional trajectories in mathematics education, situating learning within a broader developmental continuum.

In *"Secondary School Students' Critical Thinking Skills: A Comparison Between Impulsive And Reflective Students In Learning Geometry"*, Ari Suningsih, Siti Suprihatiningsih, Hidayatulloh, Ana Istiani, and Sulaiman examine the relationship between cognitive styles and critical thinking, offering insights into how different learners engage with mathematical tasks.

The article *"The Computational Thinking Profile of Vocational Students in Solving Mathematical Problems in Terms of Logical-Mathematical Intelligence"* by I Putu Pasek Suryawan, Gusti Ayu Mahayukti, I Gusti Putu Sudiarta, I Gusti Putu Suharta, and I Gusti Ngurah Pujawan explores the relationship between logical-mathematical intelligence and computational thinking, contributing to ongoing discussions about the competencies required in digitally mediated learning environments.

Finally, *"The Strategies behind the PhD in Mathematics Education Graduates' Professional Growth: Insights from a Graduate Tracer Study (2016–2023)"* by Ryan L. Cerveza offers an important perspective on doctoral education, demonstrating how pedagogical experiences during doctoral training shape professional trajectories and leadership in the field.

This closing set of contributions underscores the importance of understanding mathematics education as a continuous process that extends beyond the classroom, encompassing long-term development and professional formation.

On behalf of the editorial team of the *Mathematics Teaching Research Journal*, we extend our sincere appreciation to all authors who contributed to this *issue*. Their work reflects not only methodological rigor and theoretical depth, but also a sustained commitment to advancing the field in intellectually responsible and pedagogically meaningful ways. Each contribution, in its own scope and orientation, participates in a broader effort to rethink what mathematics education is, what it does, and what it might yet become.

These studies do more than add to an existing body of knowledge. They actively expand the conceptual boundaries of the field, interrogate assumptions that have long remained unquestioned, and open new avenues for inquiry that are both timely and necessary. In doing so, they contribute to a more reflexive and critically engaged mathematics education—one that is attentive not only to how knowledge is produced, but also to how it is mediated, experienced, and transformed across contexts.

This issue ultimately invites readers to engage with mathematics education as a situated, critical, and evolving practice, one in which knowledge is continuously shaped through the interplay of theory, practice, and context. It also calls for a sustained commitment to navigating the tensions that define the field: between abstraction and meaning, rigor and accessibility, tradition and innovation. To take these tensions seriously is not to resolve them prematurely, but to recognize them as productive spaces from which more thoughtful, inclusive, and transformative approaches to mathematics education can emerge.