

## *Investigations in Mathematical Learning*

Special Issue Call: **Mathematical Writing in PK-12 Settings**

Editorial Team: Dr. Erin Smith (editor), Dr. Kaitlin Bundock (associate editor), & Dr. Sarah Powell (associate editor)

Communicating mathematical ideas clearly, coherently, and effectively to a range of audiences is a distinct goal of mathematics instruction (National Council of Teachers of Mathematics [NCTM], 2000). One way students communicate their mathematical thinking is via writing. Writing has been found to support students' mathematical learning by promoting reflection and clarification of ideas through explanations, descriptions, definitions, and critique; supporting students' development of productive mathematical identities; and reducing students' mathematics anxiety (Boaler, 2002; Freeman et al., 2016; Ivanič, 1998; Murphy & Hall, 2008; NCTM, 2000).

**Writing in mathematics** is a distinct meta-genre of writing (Casa et al., 2016) that distinguishes between mathematical writing (MW; i.e., writing about mathematics concepts, reasoning, and ideas) and writing about mathematics (i.e., experiences and feelings regarding mathematics; see Association for Supervision and Curriculum Development, 2017; Casa et al., 2024; Casa et al., 2016; Firmender et al., 2017). MW is composed of four sub-genres: exploratory, informative or explanatory, argumentative, and mathematically creative (Casa et al., 2016; Casa et al., 2024). MW can be considered a prerequisite or corequisite skill for proof writing (i.e., effective proof writing requires elements of MW; Lew & Mejia Ramos, 2020). While this special issue will not include articles about proof writing specifically, the articles have capacity to contribute to the proof-writing literature by addressing under-researched areas related to prerequisite and corequisite skills characterized within MW.

MW has been under-explored in educational research in PK-12 (Powell et al., 2017) and teacher education (Magiera & Zambak, 2020). We invite contributors to submit extended abstracts of empirical articles for this special issue that span PK-12 (single and/or multiple grade levels) and teacher education (i.e., inservice and preservice) settings that address a range of MW genres (i.e., exploratory, informative or explanatory, argumentative, mathematically creative) and instructional components (e.g., assessment and instruction/intervention) across contexts. Such manuscripts foreground MW and might address questions including, but not limited to:

- **Pedagogical Practices.**
  - What are effective MW pedagogical practices for PK-12 students? Such practices should be inclusive of diverse populations, which may include multilingual learners, students receiving special education services, or others.
  - What are effective pedagogical practices for preparing future teachers to teach MW?
  - What MW pedagogical practices do teachers currently implement? How are those approaches adapted to meet the needs of diverse PK-12 learners?
- **PK-12 Students' MW.**
  - What are students' MW competencies across different MW genres?
  - In what ways does MW support PK-12 students' mathematics learning, engagement, and identities?
  - How might students' MW provide insights into students' learning?
  - To what degree does MW support aspects of PK-12 students' mathematical proficiency?

- **Teachers' MW.**
  - What are effective strategies for supporting PK-12 teachers' mathematical writing competencies, instruction, and/or assessment?
  - What are effective strategies for developing teacher candidates' (aka preservice teachers) competencies in teaching and assessing MW?
- **Assessment.**
  - What assessments, instruments, or approaches support investigating MW competencies, instruction, and/or assessment?
  - How do teachers assess students' MW in ways that are valid and reliable?
  - How do assessment practices vary based on MW genre, if at all?
  - How do teacher educators assess teacher candidates' (aka preservice teachers) MW? Do assessment practices vary based on MW genre, if at all?
  - How does teachers' assessment of students' MW influence their instructional decisions?
- **Other topics**
  - What systems and structures can foster and/or sustain implementation of MW in schools?
  - How does educational technology influence PK-12 MW instruction, competencies, and/or assessment outcomes?
  - What methodological approaches are used to examine MW in PK-12 or teacher education settings? What approaches seem underutilized and have potential for application?

### Submission Instructions

The submission deadline for **extended abstracts** is **October 2, 2024**. Authors should submit extended abstracts to the guest editorial team at [IMLMathWriting@gmail.com](mailto:IMLMathWriting@gmail.com) with the subject "**IML Extended Abstract**". If you have questions about the topics or submission process, then email the editorial team.

Extended abstracts should be submitted as PDFs. Each extended abstract is limited to five (5) double-spaced pages including references (references may be single spaced). They must be written in 12-point Times New Roman font and follow APA 7 guidelines. Extended abstracts should clearly articulate five aspects, which are listed here. It is encouraged to use these aspects as headers or to highlight them clearly in the proposal. Those aspects are:

- 1) Briefly problematize the topic
- 2) State research questions
- 3) Describe relevant theoretical/conceptual frameworks
- 4) Identify the related MW genre (i.e., exploratory, informative or explanatory, argumentative, or mathematically creative)
- 5) Describe methods, results, and implications

Authors will receive editor feedback on extended abstracts prior to submitting full papers for blind review. An author must submit an extended abstract in order to be considered for the special issue. All IML submissions for the special issue are reviewed by a double-blind peer-review process. Full manuscripts for this special issue are limited to **35 pages** in length inclusive of manuscript, references, figures, tables, and any ancillary information. Manuscripts should be double-spaced including references (references may be single spaced), in 12-point Times New Roman font, and follow APA 7 as well as journal guidelines. It is a requirement that published manuscripts have at least one author to be a current member of the Research Council on Mathematics Learning at time when their manuscript is accepted.

The editorial team for this special issue is Dr. Erin Smith, Dr. Kaitlin Bundock, and Dr. Sarah Powell. Questions regarding this special issue should be sent to the editorial team at [IMLMathWriting@gmail.com](mailto:IMLMathWriting@gmail.com). Dr. Jonathan D. Bostic ([bosticj@bgsu.edu](mailto:bosticj@bgsu.edu)), editor-in-chief of *Investigations in Mathematics Learning*, will support the editorial team and oversee the publishing process of the special issue.

### Timeline

- Extended abstracts due: October 2, 2024
- Editor feedback on extended abstracts: October 30, 2024
- Full manuscripts due: January 2, 2024
- Manuscripts reviews returned to authors: March 30, 2025
- Author manuscript revisions due: June 2, 2025
- Manuscript reviews returned to authors: August 30, 2025
- Final manuscript due: October 2, 2025

### References

- Association for Supervision and Curriculum Development. (2017, February 1). *Why should students write in math class?* <https://www.ascd.org/el/articles/why-should-students-write-in-math-class>
- Boaler, J. (2002). The development of disciplinary relationships: knowledge, practice and identity in mathematics classrooms. *For the Learning of Mathematics*, 22(1), 42–47.
- Casa, T.M., Cardetti, F., & Colonnese, M.W. (2024). Framing our understanding of mathematical writing. In M.W. Colonnese, T.M. Casa, and F. Cardetti (Eds.), *Illuminating and Advancing the Path for Mathematical Writing Research* (pp. 1-14). IGI Global. doi: 10.4018/978-1-6684-6538-7.ch001
- Casa, T.M., Firmender, J.M., Cahill, J., Cardetti, F., Choppin, J.M., Cohen, J., ... Zawodniak, R. (2016). *Types and purposes for elementary mathematical writing: Task force recommendations*. Elementary Mathematical Writing Task Force. [https://mathwriting.education.uconn.edu/wp-content/uploads/sites/1454/2016/04/Types\\_of\\_and\\_Purposes\\_for\\_Elementary\\_Mathematical\\_Writing\\_for\\_Web-2.pdf](https://mathwriting.education.uconn.edu/wp-content/uploads/sites/1454/2016/04/Types_of_and_Purposes_for_Elementary_Mathematical_Writing_for_Web-2.pdf)
- Firmender, J.M., Casa, T.M., & Colonnese, M.W. (2017). Write on: Reasoning through mathematical writing. *Teaching Children Mathematics*, 24(2), 84-92. doi: 10.5951/teachchildmath.24.2.0084
- Freeman, B., Higgins, K. N., & Horney, M. (2016). How students communicate mathematical ideas: An examination of multimodal writing using digital technologies. *Contemporary Educational Technology*, 7(4), 281-313.
- Ivanič, R. (1998). *Writing and identity*. John Benjamins.
- Lew, K., & Mejia Ramos, J.P. (2020). Linguistic conventions of mathematical proof writing across pedagogical contexts. *Educational Studies in Mathematics*, 103, 43-62. <https://doi.org/10.1007/s10649-019-09915-5>

- Magiera, M.T. & Zambak, V.S. (2020). Exploring prospective teachers' ability to generate and analyze evidence-based explanatory arguments. *International Journal of Research in Education and Science (IJRES)*, 6, 327-346.
- Murphy, P., & Hall, K. (2008). *Learning and practice: Agency and identities*. Sage.
- National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics* (Vol. 1). Author.
- Powell, S.R., Hebert, M.A., Cohen, J.A., Casa, T.M., & Firmender, J.M. (2017). A synthesis of mathematics writing: Assessments, interventions, and surveys. *Journal of Writing Research*, 8(3), 493-526. doi: 10.17239/jowr-2017.08.03.04