Conference theme: Circles of Resonance in Mathematics, Sciences, and Arts

MACAS 2025 CONFERENCE Proposal

Title: Connected Lines: Investigating Preservice Teachers' Self-Efficacy with Literacy-Mathematics Curricular Integration

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Type of intended presentation: Online presentation

Type of communication: An overview of the findings of a pilot study examining preservice teachers self-efficacy with literacy-mathematics curricular integration.

Proposal objective and connection to Symposium theme: This study (part of a larger project) explored preservice teachers' (preservice teachers') self-efficacy teaching mathematics, language arts (language arts), curricular integration, and literacy-mathematical curricular integration (literacy-mathematics curricular integration) with the research questions: (1) Is there a difference in preservice teacher's self-efficacy for teaching mathematics, language arts, curricular integration and literacy-mathematics curricular integration? (2) How do preservice teachers' self-efficacy sub-scores correlate for teaching mathematics, language arts, curricular integration, and literacy-mathematics curricular integration?

Introduction: Although the importance of curricular integration as a way to support students in developing and applying their understanding of concepts across multiple disciplines, elementary classrooms often approach subjects separately (Bartels et al., 2019; Drake et al., 2014; Kirwan, 2022). Approaching subjects as isolated units fails to consider the research that highlights the positive impact curricular integration has on student learning (Spielman, 2018), particularly regarding improvements to students' disciplinary knowledge, its application to 'real-world' contexts', and "general, transferable, and broadly applicable" knowledge and skills (Cohen et al., 2024, p.11). As Kreijkes and Greatorex (2013) advise, to address the unproductive dichotomy between subject-specific teaching and curricular integration, approaches need to complement each other.

Objectives:

- Present initial insights into preservice teachers' self-efficacy teaching mathematics, language arts, curricular integration and literacy-mathematics curricular integration, highlighting statistically significant relationships and qualitative themes.
- Discuss the barriers preservice teachers face in implementing literacy-mathematics curricular integration as identified in the pilot study

Statistically Significant Differences in Preservice Teachers' Self-Efficacy: Self-efficacy is a key factor that influences behaviour, affecting one's motivation, effort, and persistence in pursuing a task (Bandura, 1997). This presentation will explore the statistical differences between preservice teachers self-efficacy teaching:

- Mathematics in comparison to language arts
- Curricular integration in comparison to literacy-mathematics curricular integration
- Language Arts in comparison to Literacy-Mathematics Curricular Integration
- Mathematics in comparison to Literacy-Mathematics Curricular Integration

Preservice Teachers Perspectives of Literacy-Mathematics Curricular Integration: When educators understand the connections within and across subjects, they are able to engage students in more meaningful learning (Dewey, 1916). Specifically, this presentation will draw attention to:

- The mathematical concepts preservice teachers are most and least confident with
- The aspects of language arts that preservice teachers have high and low levels of confidence in
- Preservice teachers' view and concerns of literacy-mathematics curricular integration

Curricular Integration by Preservice Teachers is not without its Barriers: In recent years, provincial curricula (e.g., Ontario Ministry of Education, 2020; 2023; PEI Department of Education and Lifelong Learning [DELL], n.d., 2023; BC Ministry of Education, 2024) has called for curricular integration practices in elementary classrooms, however this same call has not been ingrained within teacher education (TE) programs (Boche et al., 2021; Shulman, 1987). This lack of experience with curricular integration in teacher education (Boche et al., 2021) could perpetuate a disconnection in preservice teacher knowledge (Harr et al., 2015) and their ability to integrate subjects in their own practice. Barriers that will be discussed include:

- Unfamiliarity with the concept
- Access to curricular integration training (especially in relation to literacy-mathematics)
- Lack of resources that are directly applicable to the classroom context

Conclusion: The results reveal that preservice teachers have limited self-efficacy in literacy-mathematics curricular integration. While they recognize its importance for deepening students' knowledge across subject areas, they struggle to envision how to apply it given a lack of experience, training and resources available. This is further hindered given the scarcity of resources and absence of literacy-mathematics curricular integration in teacher education programs, and consequently impacts preservice teachers' ability to employ literacy-mathematics curricular integration early in their careers (Heywood et al., 2012). The larger study seeks to explore preservice teachers' ability to apply literacy-mathematics curricular integration, identify gaps in their confidence, understanding, skills and practices, and determine areas where teacher education programs could support the implementation of literacy-mathematics curricular integration. This presentation will provide initial insights into preservice teachers' self-efficacy teaching literacy-mathematics curricular integration, highlighting challenges integrating the two subjects and the current gap in teacher education.

Expected Outcomes:

- Identify preservice teachers' self-efficacy levels teaching mathematics, language arts, and literacy-mathematics curricular integration
- Gather insights into the specific challenges preservice teachers face integrating literacy and mathematics (e.g., lack of training, resources, experience)
- Develop recommendations for enhancing teacher education to better prepare preservice teachers to effectively integrate literacy and mathematics in the classroom
- Develop teaching resources that support preservice (and inservice teachers) in integrating literacy and mathematics

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