

Washington State University

College of Education

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Will defend the dissertation on

Date: April 17, 2024

Time: 10:00 A.M.

Pullman Campus – Education Addition 210

Faculty, students and the general public are encouraged to attend

WRITING-TO-LEARN PRECALCULUS

Chair: Kristin Lesseig

Despite growing theoretical and empirical evidence that writing has the potential to be an effective tool for student learning in undergraduate mathematics, writing-to-learn integration in mathematics is rare. Major deterrents include perceived lack of alignment between writing and learning goals, deficit views of students' writing abilities, and the absence of a conceptual framework and methodological tools for systematically examining student learning as evidenced in their writings. To address these issues, this embedded qualitative case study offers a conceptual framework for examining student performance relative to task-specific learning goals in students' written artifacts. The writings of 10 students enrolled in a Writing-Intensive Precalculus course were analyzed from a module on polynomial functions, resulting in 159 items coded using qualitative content analysis to determine the extent to which students' writings demonstrated their performance in relation to learning goals. Students were also surveyed and completed a written reflection regarding which writing activities they determined to be most valuable and how they saw writing as contributing to learning. Findings suggest students are overwhelmingly able to produce complete and correct responses to a variety of writing prompts with a moderate level of depth but are less consistent in producing clear responses. Main findings indicate that the structure of the writing assignment, type of question posed, question focus, and individual student inclinations each play a role in the extent to which learning is evidenced in students' writings. Further, students generally perceive writing as a valuable tool for mathematics learning and for helping them communicate mathematical ideas, reflect on their understanding of course content, think critically, make connections between concepts, deepen their content knowledge, and retain knowledge. Based on these findings, I suggest a number of implications for those seeking to integrate writing into mathematics courses and offer avenues for future research.