

Homework Journaling in Undergraduate Mathematics

Alexis Larissa Johnston

ABSTRACT

Over the past twenty years, journal writing has become more common in mathematics classes at all age levels. However, there has been very little empirical research about journal writing in college mathematics (Speer, Smith, & Horvath, 2010), particularly concerning the relationship between journal writing in college mathematics and college students' motivation towards learning mathematics. The purpose of this dissertation study is to fill that gap by implementing homework journals, which are a journal writing assignment based on Powell and Ramnauth's (1992) "multiple-entry log," in a college mathematics course and studying the relationship between homework journals and students' motivation towards learning mathematics as grounded in self-determination theory (Ryan & Deci, 2000). Self-determination theory predicts intrinsic motivation by focusing on the fundamental needs of competence, autonomy, and relatedness (Ryan & Deci, 2000). In addition, the purpose of this dissertation study is to explore and describe the relationship between homework journals and students' attitudes towards writing in mathematics.

A pre-course and post-course survey was distributed to students enrolled in two sections of a college mathematics course and then analyzed using a 2×2 repeated measures ANOVA with time (pre-course and post-course) and treatment (one section engaged with homework journals while the other did not) as the two factors, in order to test whether the change over time was different between the two sections. In addition, student and instructor interviews were conducted and then analyzed using a constant comparative method (Anfara, Brown, & Mangione, 2002) in order to add richness to the description of the relationship between homework journals and students' motivation towards learning mathematics as well as students' attitudes towards writing in mathematics.

Based on the quantitative analysis of survey data, no differences in rate of change of competence, autonomy, relatedness, or attitudes towards writing were found. However, based on the qualitative analysis of interview data, homework journals were found to influence students' sense of competence, autonomy, and relatedness under certain conditions. In addition, students' attitudes towards writing in mathematics were strongly influenced by their likes and dislikes of homework journals and the perceived benefits of homework journals.