

Using Stories to Understand the Attitudes of Students in Entry-Level Mathematics Courses

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It has long been recognized that attitudes towards mathematics impact how students learn and the degrees to which they achieve in mathematics (Hwang & Son, 2021). Most work on college students' attitudes towards mathematics revolve around students who are pre-service teachers (Watson, 2019; Zazkis, 2015) or in-service teachers (Drake et al., 2001) and its impact on teaching. In this study, we describe the types of mathematical autobiographies that students possess in an entry- or freshman-level mathematics course (e.g., College Algebra). Namely, we add on to Watson's (2019) dissertation findings where she found that pre-service teachers' prompts to humanize mathematics fit into three categories: (1) Friendly - mathematics has been a lifelong friend; (2) Familial - mathematics is like a brother, sister, father, grandmother, etc; and (3) Antagonist - mathematics is a bully or trying to hold a person back.

The goal of our study was to further examine and refine these categories and to assess whether these categories were useful in describing other populations of students, such as those enrolling in a freshman-level, non-majors, mathematics course. To assess this, we asked students participating in a 'Launch into the University' initiative over the summer of 2023 to humanize mathematics and tell their story or relationship with mathematics throughout their schooling. These students were taking the university's freshman-level English and Mathematics courses (e.g., English 101 and College Algebra) with extra support from embedded tutors. Many of these students had their high school learning impacted by COVID-19 and the ensuing pandemic. In our analysis, we found that Watson's (2019) categories remained useful and accurate in describing the types of stories that students wrote in regard to their relationship with mathematics. We also found that an additional category was useful in describing these students' stories. Namely, that mathematics can be a 'Frenemy.' Watson (2019) described Frenemy to be under the category of Antagonist; however, we found that this description was useful as a separate category and more akin to Drake and colleagues' (2001) 'roller-coaster' relationship. We found this distinction to be important as students in the Antagonist category had (mostly) negative leaning stories. This was in contrast to what we saw as a Frenemy or roller-coaster type of relationship, where students expressed how they used to be friends with mathematics (or had a more positive view), and some experience or experiences caused their relationship to change directions. It was also noticeable how impactful the teacher is in impacting a student's story, consistent with previous work on this subject (e.g., Watson, 2019)

In this poster session we hope to prompt the following discussion: *What can we do as instructors to help to shift student's perceptions about mathematics? How can we leverage student's stories to help them succeed in early mathematics courses?*

References

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