Queerness is an entity which often defies categorization and as such it can be hard to unpack notions of queerness; furthermore, this becomes increasingly difficult when one considers queerness in the context of Mathematics. In this study we draw on large scale survey data and iterative categorization to understand and unpack students’ self-described sexual identity. Specifically, we present data from students enrolled in introductory math courses at 20 universities across 898 classrooms. Queer spectrum students, those identifying in some way with the sexual minority, represented 10.0% (n=2,454) of the total student responses in the study (n=24,327). Quantitative analysis reveals a pattern that Asexual students report the most positive instructional practices (instructor interactions, peer interactions, math affect, sense of community) while Bisexual and Queer+ (e.g., queer, pansexual, multiple queer identities) students report the lowest levels of positive instructional experiences. Insights from this analysis and follow-up student interviews provide recommendations for programmatic supports for queer spectrum students. (Received September 12, 2019)