

Finding Joy in the Abstract

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“This is the most fun I have ever had in a math class,” exclaimed one of the students during a collaborative homework session. A collective revelation followed - none of us had had this much fun in mathematics before. Our abstract algebra class, which started as a space of insecurity for some, had morphed into a community of joy and playfulness that encouraged us to explore mathematics in ways we had never considered before. This study aims to describe the characteristics of a joyful mathematics classroom through the lived experiences of researcher-participants in this course, which can be applied to secondary and post-secondary mathematics settings.

The Need for Joy and Play in Mathematics

Su (2020) declares, “We would teach math so differently if we thought of it as a playful sport, not a performance sport” (p. 62). Joy and playfulness lead students to develop more nuanced understandings of mathematics and encourage them to pursue it further (e.g., Takeuchi et al., 2016). Experiences of joy and play also contribute to rehumanizing mathematics and pushing the field towards much-needed culturally and historically responsive work (Gutiérrez, 2018). Research on joy and play in mathematics spaces has increased; however, while there are some exceptions (e.g., Ellis et al., 2024), most studies have predominantly focused on early education or primary school settings, overlooking the potential for joy and play as we mature into adulthood (McLennan, 2020; Solarski, 2018). There is little work on rehumanizing mathematics in postsecondary settings (Gutiérrez et al., 2025; MacArthur et al., 2025).

Methods and Preliminary Findings

This study examines our experiences as five doctoral students at a large mid-Atlantic university as we participated in an Abstract Algebra seminar class. Our group included four female students and one male student studying mathematics or physics education, two of whom had previously taken an abstract algebra class. One student identifies as Latina, one as MENA, one as Black, and two as White. We met weekly to explore topics in abstract algebra, including sets, groups, rings, logic, and fields. Homework was assigned weekly, and collaboration was strongly encouraged. We also read and discussed papers that defined algebra and its relevance to K-12 mathematics education. We applied a mixed-methods concept mapping analysis (Windsor, 2013; Trochim, 1989) to collaboratively synthesize our diverse ideas into a shared framework, identifying the characteristics of a joyful and playful mathematics classroom. Preliminary themes of structured flexibility, safety, exploration, and community have begun to emerge as among the most imperative characteristics of our joyful and playful mathematics class.

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