

How Undergraduate STEM Students With Math Anxiety Persist Through Their Academic Careers

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Background and Motivation

Math anxiety is one of the main reasons that students avoid majors that would require them to take math classes in the process (Ashcraft & Moore, 2009; Dowker et al, 2016). Lee (2009) has found that there are high achievers in math who are also highly math anxious. The antecedents of math anxiety were investigated by Luttenberger et al (2018) in which they have found that significant people in students' lives, such as teachers, can affect students' development of math anxiety. A qualitative study by Quan-Lorey (2017) found that teachers, self-imposed pressures, and bad grades are some of the roots of math anxiety. A motivation of this study is due to the observation that, despite there being numerous studies surrounding math anxiety, most of the studies are with non-STEM college students. Some participants of this study have expressed the need to address math anxiety experienced by STEM majors due to the necessity of math in their respective majors. This study highlights that math anxiety also impacts STEM majors, and what they do to navigate their college careers while persisting through their math anxiety. In this study, I seek to answer the following research questions: (1) What factors affect undergraduate STEM students' math anxiety in college? (2) What strategies are utilized by high achieving students to help them succeed despite their math anxiety? (3) What motivations do students possess to continuing in pursuing their STEM majors despite having math anxiety?

Methods

This qualitative study included 10 STEM students experiencing math anxiety that volunteered to participate. The participants are currently taking Calculus II, given most students in Calculus II are STEM majors and the target demographic. The study was conducted through semi-structured interviews where participants were asked about their earliest experience of math anxiety. From there, participants were asked how they have been navigating their academic career within their respective STEM major given their math anxiety. Furthermore, participants were asked about study and learning strategies they have implemented to help cope with their math anxiety. Aside from how they combat their math anxiety, a key factor that was investigated further was the students' motivations and why they remained in the STEM academia despite their math anxiety. The goal is in knowing how they tackle it and what motivates them to do so will allow future educators and students to be aware of and minimize their math anxiety.

Results

In this poster report, I present evidence that all of the participants have unique experiences with math and the development of their math anxiety. Most of the roots of their math anxiety are aligned with the previously mentioned findings of Quan-Lorey (2017) and Luttenberger et al (2018). As they traverse through college, they find that the levels of their math anxiety vary depending on their teachers and the difficulty of the class. When participants were asked about their motivation in pursuing/persisting through their math anxiety, a couple of themes arose. One of which is the job security that comes with the STEM major that they chose. The other is their innate passion and determination to change the future for the better. I will also discuss in this poster different strategies students implement to manage their math anxiety.

References

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