

The Workshop

The workshop is being embedded into an extended section of Business Calculus where students meet for 2 hours twice a week vs the standard 75 minutes twice a week.

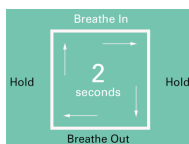
The workshop has three main educational objectives beyond the goals of the research:

- 1) Increase the academic success of students in Business Calculus.
- 2) Expose students to skills that can be used in future classes and their careers.
- 3) Bring value to the overall academic experience of students.

- Workshop focuses on helping students with nonacademic and mathematics strategy skills specifically tailored for Business Calculus
- Topics include growth mindset, metacognition, time management, mathematics anxiety, mathematics test-taking strategies, calculator skills, procrastination, feedback, goal setting, communication skills, mathematics literacy, and more.
- Workshop includes class discussions, group discussions, personal reflections, group activities, and videos.
- Workshop was piloted in Fall 2023.

Box Breathing

To delineate from regular class time (first 75 minutes) to workshop time (last 45 minutes), I guide the students through the box breathing exercise for around 2 minutes. We started this on the first day of class and do it every class time. This allows students to be exposed to a technique which can reduce stress and anxiety. I also guide them through this on exam day for a longer period.



Examples of Activities

Example 1: Communication Skills

(After watching a short video) On your own, think about how you feel working with others in a school or work setting. Do you enjoy or not enjoy working with others? What do you think makes a good group work? How do you plan on making your calculus group work this semester?

Example 2: Metacognition

(After watching a short video) Have you heard of metacognition before? How would you rate your own metacognition? Using some of the tips in the video, **how do you plan to study for exam 1?** Be as detailed as possible.

Example 3: Reflecting on an Exam

Let's take some time to dissect the exam. Go through each question and **circle** whether you felt comfortable with the question or not while taking the exam. If the question was partially incorrect or fully incorrect, write the mistake(s) you made or what might have confused you while attempting it.

Learning to Learn Mathematics

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Learning mathematics in higher education is so much more than learning content. It requires students to have metacognition skills, growth mindset, time management, emotion control, and more! **HOW CAN WE HELP OUR STUDENTS???**

I have created a special workshop which is being facilitated as an educational intervention that helps students learn to learn mathematics by focusing on nonacademic skills and mathematics strategy skills specific to learning Business Calculus.

Conceptual Framework



Scan to download lesson plans, activities, data collection tools, and more.

Investigating the effectiveness of the intervention by measuring mathematics anxiety, self-efficacy, and academic achievements throughout the semester. Additionally, investigating the usefulness of the intervention from the student perspective.



The Research

To measure the effectiveness and usefulness of the intervention, I am conducting a quasi-experimental study within an action research paradigm using mixed methods.

Research Questions

- 1) What is the effectiveness of an intervention for Business Calculus focused on nonacademic and mathematics strategy skills regarding students' academic achievements, mathematics anxiety, and mathematics self-efficacy?
 - a) How do the academic achievements, mathematics anxiety, and mathematics self-efficacy of students enrolled in an intervention for Business Calculus vary, if at all, over the course of a semester with demographics of students as covariates?
 - b) How do the academic achievements, mathematics anxiety, and mathematics self-efficacy of students NOT enrolled in an intervention for Business Calculus vary, if at all, over the course of a semester with demographics of students as covariates?
 - c) How do the changes, if any, in academic achievements, mathematics anxiety, and mathematics self-efficacy compare between the students enrolled in the intervention and the students not enrolled in the intervention?
- 2) How do students enrolled in the intervention perceive the usefulness of that intervention?
- 3) What is the relationship between students' perceived usefulness of the intervention and students' academic achievements, mathematics anxiety, and mathematics self-efficacy?

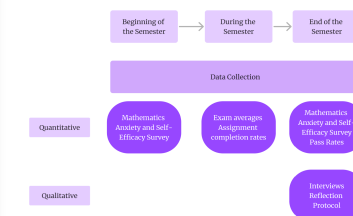
Data

Two sections of Business Calculus:

Control Group: Standard twice a week 75 min course

Intervention group: Twice a week 2 hours course (where the workshop is embedded in the extra 45 minutes)

Both quantitative and qualitative data are being collected throughout the semester.



The GOAL:

To investigate if providing an innovative, unique, and engaging experience in higher education relating to **learning to learn mathematics** can impact student outcomes in a positive way and provide a resource students find useful