

Introduction

Background:

- Learning Statistics is challenging and has been known to cause anxiety (Macher et al., 2012).
- Students have said that mnemonics help with anxiety (Mocko et al., 2017).
- When students are provided with mnemonics, they often fail to understand and apply the mnemonics that they can recall (Mocko et al., 2024), and therefore, we are exploring students creating their own.
- The **purpose** of this research is to explore how students use and reflect on using and not using LLM models to create mnemonics.

Research Questions:

- In what ways do students prefer to create mnemonics with or without
- In what ways does or does not the creation and compilation of mnemonics help alleviate statistical anxiety?

Methods

Population: 106 enrolled students in two sections of QMB 5304, Introduction to Managerial Statistics, in Spring 2024.

Activity: Students completed exit tickets before the first exam without LLM and then after with LLM. At the end of the term, they also completed a 10-question reflection. 74 students consent to participate (IRB #: 202302020)

Method of Analysis: A qualitative analysis was conducted with predetermined codes, and codes were added when new themes were identified. Two people coded responses to the 10 reflection questions separately and then discussed them together until the codes were in 100% agreement.

Exit Ticket and Mnemonics Generated	
EXIT TICKET AFTER the FIRST Exam Instructions: • Unlike the previous Exit Ticket, you are required to use generative AI tools, such as ChatGPT, to help you generate mnemonics. • Each person must submit this assignment into Canvas.	MNEMONICS VIR HIGHER THAN 5, MULTICOLLINE ARITY IS ALIVE
 Purpose: This opportunity is for you to think about and consolidate what you have learned in this module so far. We recognize that we now live in a world of generative AI and we want you to build skills on how to use this as well in your study process. In this section of the material, you are required to use a generative AI program. The instructor will give a short introduction to using a generative AI product. Declarative Knowledge Think back to what we have worked on today. Please list two declarative knowledge items that you learned today. (Declarative knowledge would be definitions and simple relationships.) 	PGA FAIRWAY (P VALUE GREATER OR EQUAL TO THAN ALPHA, FAIL TO REJECT)
 2. Process Knowledge Now, think about the process knowledge that you learned today. Please list two processes that you learned today. Processes would be completing a series of steps to solve a problem. 1. 2. What topics in statistics from today's module do you think would be hard to remember? Explain your 	HELP SAM CALL DOCTOR (HELP > SAMPLE INDEX > CALCULATORS > DISTRIBUTION
reasoning. Create a mnemonic to help you remember something from today's material, using generative AI. Express your level of agreement with these statements. 1 Strongly Agree 2 Somewhat Agree 3 Somewhat Disagree 4 Strongly Disagree I am confident that the mnemonic from the generative AI output is correct.	ARIN (ASSUMPTIONS, RANDOM, INDEPENDENT, NEARLY
I am confident that the mnemonic from the generative Al output is useful as is. I am confident that the mnemonic from the generative Al output will be useful after I make a small change. I am confident that I could have created a better mnemonic on my own without using generative Al at all. Explain.	NORMAL) INDICATOR ADJUSTS THE STARTS, INTERACTION TILTS THE PART

Creation of Mnemonics with and without AI in a Master's Level Business Statistics Course

Megan Mocko, Larry Lesser, Alejandra Lugo, Megan Shein

Results

Which method did you prefer in creating the mnemonics with your partner(s) without technology or with generative AI, such as ChatGPT? Explain. Combination: "We should get the idea from ChatGPT and develop it on our own or do the opposite; that way we can make sure that the information coming out of AI is correct." More Efficient: "However, utilizing generative AI like ChatGPT offers efficiency and 7% a vast range of suggestions, potentially sparking new approaches to mnemonic creation." With AI **Expanded Options: "Although my** 43% partner and I have rich imagination, our thinking may be limited by personal experience and knowledge scope. The mnemonics provided by ChatGPT may contain perspectives or connections that we have not considered, increasing the diversity and innovation of creativity."

Did the creating and compiling of mnemonics increase or decrease your anxiety about the upcoming exams? Explain.





Confidence: "Creating and compiling mnemonics reduced my feelings of uncertainty and anxiety because I felt more preparation and in control of the material by actively studying and organizing information through mnemonics. This increased confidence in one's knowledge can alleviate anxiety about the

> **Preparation:** "This systematic method reduced the overwhelming nature of the exam preparation process and made studying feel more achievable."

Memory: "Overall, mnemonics acted as effective tools for reducing exam-related stress by facilitating understanding, retention, and recall of the study material."

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Conclusions

• Mnemonics created by humans were preferred by some students because they were able to make **personal connections**. These personal connections align with cognitive learning theory that students can learn more if they can make connections to previously learned connections (Ertmer & Newby, 2013).

• Using AI in the creation of mnemonics was preferred since its use made the process more **time-efficient**.

Students felt more prepared and confident about the material when the mnemonic exit ticket process was employed. Although the connection between anxiety and confident was not linked in a study using Kahoot! (Shaker et al., 2021), perhaps this method shows a possible association because it removed the time pressure involved in the Kahoot! study.

• Some students felt additional anxiety during the creation of mnemonics, because it increased **negative thought patterns**. This increase in negative thoughts might actually be connected to students' self-efficacy. Students with low levels of self-efficacy tend to have higher statistical anxiety (Hoegler & Nelson, 2018).

• This activity of using generative AI and not using generative AI allowed students to explore their own learning and studying styles as well as to reflect on how generative AI fits into their learning process. Students should reflect on where using generative AI is beneficial and when it is not.

References