Effectiveness of self-made mnemonics

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Abstract

The use of mnemonics by college students has been proven to increase success in challenging subjects; however, there has been little research done on how students feel when they created and used their own mnemonics to increase one's comprehension of the material. Our research reports the results from Sac State students in Spring 2022 where we dedicated 10-15 mins in our PAL classes to have students create their own mnemonics to build personal connections to the material. After every exam, we provided anonymous surveys in order for students to report to us how they felt about using their self-made mnemonics and if it had helped them perform better on exams. The first exam was our baseline measurement such that we did not inform our students to create any mnemonics for it. For the exams that followed, we started to encourage the idea for students to start forming mnemonics to help them with their studies and upcoming exams. The reported mnemonics used by the students during their exams were the personally made mnemonics from PAL.

Background/Introduction

The primary goal of this research project was to determine if there is a correlation between the usage of self-made mnemonics by students in stem classes and an increased appreciation and ownership of the course material. We also hypothesized that the creation of mnemonics as a study practice would correlate to an increase in exam performance greater than that associated with non-self-made mnemonics. Mnemonics have been known to be very useful in memorizing difficult processes and concepts for exams, especially in the field of STEM (Qureshi et al., 2014, Putnam, 2015). When looking closer at these mnemonics we found that there are many different forms of mnemonics that students tend to use that allow this tool to be able to be used in many different subjects.

There are many types of mnemonics including mnemonics that use a relation to a word (CATions are PAWsitive), mnemonics that make a sentence by using the first letter of the topic (Please Excuse My Dear Aunt Sally) or using the first letters to make a phrase (OIL RIG). (Miller, 1967). Mnemonics can be used in visual forms as well. The use of visual mnemonics not only helps with the memory of the concepts but also engages the student's creativity (Cioca & Nerișanu, 2020). These devices are extremely versatile for students to use and are also very helpful with increasing their memory in difficult concepts.

Our group hypothesized that through creating mnemonics, together and on their own, the students could develop a greater connection to the course material and develop devices that could assist in retaining difficult concepts that might hinder them on their exams. In order to determine if this strategy was effective, we helped students in creating mnemonics to use during our PAL sessions. We then conducted anonymous surveys of the students through Qualtrics, aiming to assess their feelings about making the mnemonics and towards the class, as well as whether they used the mnemonics they had created on their exams. We also requested the students' exam scores in order to analyze the impact this practice had on their performance. We were able to track changes in sentiments and exam scores over the course of the semester whilst maintaining the students' anonymity.

Methodology

In order to determine if PAL students benefited from creating and implementing their own mnemonic devices, we encouraged our PAL students to make and use their own mnemonic devices during their exams. Once a week, during PAL class, we asked the students which areas of their course material they found most difficult. They were then split into small groups and were asked to devise some mnemonics pertaining to the difficult topics discussed.

Methodology (continued)

After each exam, the facilitator administered an anonymous survey using Qualtrics. This survey asked several questions pertaining to the student's use of mnemonics as well as how they connected with them. The survey presented these five questions:

1. Did you use mnemonics on your exam? (Yes or No), If you used mnemonics, where did they come from? (PAL, Lectures, videos etc..),
2. What were your favorite mnemonics we created in PAL, and their meanings? (Top Three) Why did you like these mnemonics the most?
3. How helpful were these mnemonics in remembering the material? (Scale 1-5),
4. What was your exam score?

Students were also asked to create a secret code name to use for every survey that way we could track the students survey responses while also keeping their anonymity. Using these results, we were able to see whether our students used their self-made mnemonics the most and whether they found the creation and use of the mnemonics helpful in understanding the difficult criteria. These questions provided us with opportunities for qualitative analysis on the student's personal connection with their made mnemonics vs ones another person created.

Results

"This mnemonic I created myself in PAL and the process of brainstorming to make easy to remember mnemonics helped me remember."

"It was silly so it was memorable."

Figure 1:
Quotes from some students about the experience of making mnemonics in their PAL classes.

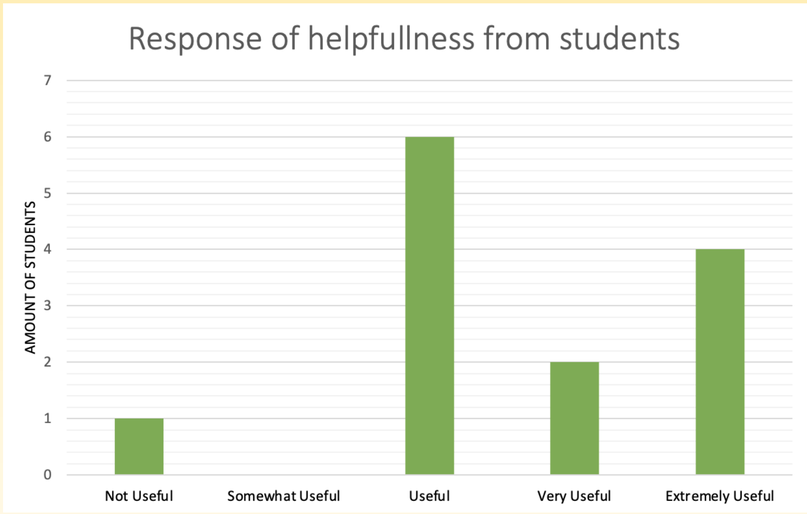

Figure 2:
This data was compiled from question number three on the survey. 92% of the responded students found their self-made mnemonics either Useful, Very Useful or Extremely Useful.

Results (continued)

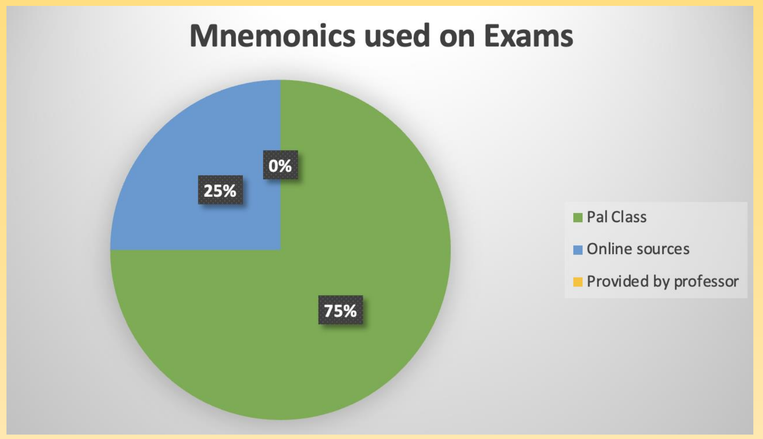

Figure 3:
This data was pulled from question number two of the survey.

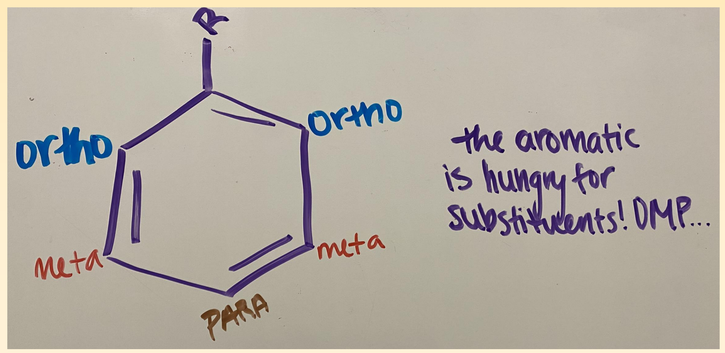

Figure 4:
Shown here is one example of the student made mnemonics.

Discussion and conclusion

In conclusion, our data showed that the mnemonics created in PAL classes were the most used compared to students learning them in class or finding them online. This was because we allow time in PAL classes to let students brainstorm and interact with the material to create mnemonics that would be meaningful to them. On a scale of 1-5, students found mnemonics to be useful because it was easy to remember such that it correlated with their own humor or that it rhymed. PAL mnemonics were used during exams to help them recall important concepts to guide them towards making an intellectual answer; however, the recorded data for the average test scores showed little difference and resulted inconclusive. Our research demonstrates that when given the time to review the material, students were able to actively make connections and increase their knowledge to create mnemonics that would be beneficial to their learning.

References

Cioca, L.-I., & Nerişanu, R. A. (2020). Enhancing creativity: Using visual mnemonic devices in the teaching process in order to develop creativity in students. *Sustainability*, *12*(5), 1985. https://doi.org/https://doi.org/10.3390/su12051985

Miller, G. R. (1967). (rep.). *An Evaluation of the Effectiveness of Mnemonic Devices as Aids to Study* (pp. 2–80). El Paso , TX: University of Texas at El Paso .

Putnam, A. L. (2015). Mnemonics in education: Current research and applications. *Translational Issues in Psychological Science*, *1*(2), 130–139. https://doi.org/http://dx.doi.org/10.1037/tps0000023

Qureshi, A., Rizvi, F., Syed, A., Shahid, A., & Manzoor, H. (2014). The method of loci as a mnemonic device to facilitate learning in endocrinology leads to improvement in student performance as measured by assessments. *Advances in Physiology Education*, *38*(2), 140–144. https://doi.org/https://doi.org/10.1152/advan.00092.2013