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Lo-Fi Music and its Effect on Memory Retention Among Selected Freshmen Board Program Students from a University in Quezon City, Philippines

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Abstract:- With its relaxing but nonsleepy atmosphere, lo-fi music has gained popularity among students while studying with younger students being more likely to listen to music to aid in their concentration. However, previous research on the effect of music on memory retention has produced conflicting results on its efficacy and little research has examined lo-fi music in particular. This study explored the effect of lo-fi music on memory retention through an experimental, between-groups research design. The memory retention test utilized was patterned after Ebbinghaus's research on memory, a list of 50 3-letter nonsense syllables with a consonant-vowel-consonant pattern. An allotted time of 2 minutes to memorize and 5 minutes to write down what was retained was given to the 150 participants who were divided into two groups: default classroom noise and lo-fi music. Through the independent samples t-test, it was found that those exposed to lo-fi music during the memory retention test had significantly higher scores.

Keywords:- *Lo-fi Music, Board Programs Students, Memory Retention, Quezon City, Philippines.*

I. INTRODUCTION

Low-fidelity music, or lo-fi music, has seen a significant amount of growth and popularity since the pandemic and up until the present day. It is characterized by environmental noise, a low hum, and imperfections. The lack of lyrics, predictable nature, and relaxing but nondrowsy tempo contribute to its popularity while studying (Vaughn College, 2021). According to Gitnux (2023), lo-fi music has grown by over 200% in the past year, becoming one of the fastest-growing genres in the music industry. A lo-fi music livestream that started in February 2020 had viewers ranging from 30,000 to 60,000 at any point of the day (Bhatt, 2022). Lo-fi music has been specifically found to aid in relaxation and attention (Kirk et al., 2021). In a 2016 survey (Kumar et al.), 60% of students were found to prefer listening to music while studying to improve concentration. Younger students, aged 18-25, are most likely to listen to music while studying at a 58% occurrence compared to 41% of those aged 58 to 76 and 39% of those 77 and older (Steinberg, 2022). Music activates the parts of the brain involved in memory, reasoning, speech, emotion, and reward (Fabiny, 2015). The influence of music on cognitive abilities has long been studied, leading to Francis Raucher's Mozart effect in 1993. Raucher proposed that classical music has the ability to temporarily boost one's cognitive abilities. Memory retention is the ability to retrieve information after a period of time (Siu, 2022).

Current research presents mixed results on the influence of music on memory retention, ranging from no significant difference (Rahmi et al., 2023), the effect being individualized (Fawzy et al., 2022), having a negative influence (Musliu et al., 2017), and having a positive influence (Lehmann & Seufert, 2017). One such study by Scarratt et al. (2023) highlights the highly similar datasets of study and sleeping playlists on Spotify, which among them is lo-fi music, suggesting that this music creates a non-distracting but pleasant environment. As the younger generation uses music to help them focus while studying and lo-fi's use for studying rises in popularity, the researchers sought to investigate the influence of lo-fi music on memory retention as previous research primarily centered on classical music.

II. RESEARCH METHOD

This study used a quantitative, experimental research method with a between-group design. Random sampling is acknowledged as the preferred strategy for obtaining an accurate and impartial estimate of the impact of an intervention (An & Tillman, 2015). According to McLeod (2023), this particular form of study is conducted in a controlled environment, which may not necessarily be a laboratory setting. As a result, it allows for exact

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measurements and amounts to be obtained. The researchers made deliberate decisions on the location, timing, participant selection, and implementation of a standardized process under specific conditions for conducting the experiment to ensure a controlled environment that is consistent. The researchers utilized a between-group design considering the potential order effects in memorization, in which the researchers divided the participants into two (2) groups: the controlled group and the experimental group.

In this experiment, the students filled out a form about their demographic details once randomized into their respective groups. Utilizing a memorization test for the participants, the respondents were given a list of 50 nonsense syllables to memorize within 2 minutes. Each syllable contains 3 letters that follow the pattern of consonant-vowel-consonant. Shortly afterward, they were asked to write down as much as they had retained within

The researchers utilized an experimental research method to explore whether lo-fi music has a significant effect on memory retention. Participants were divided into two groups, the control and experimental group, utilizing a between-groups design. This framework helped structure and organize the research process, which made it easier to understand the different steps of the study on how lo-fi music affects memory retention.

III. DATA ANALYSIS

The statistical analyses will be performed using IBM SPSS Statistics (Version 27). Results with a p-value < .05 are considered statistically significant. For the first research question, the data underwent descriptive statistics to determine the frequency and percentage that are representative of each age group and college program of the participants (Villegas, 2022). The second research question concerns the summary statistics (mean, median, mode, and standard deviation), which investigates the central tendency of the scores in the experimental and control groups (Kaliyadan & Kulkarni, 2019). Assessing for significant differences between the board programs within the two groups, according to the third research question, the researchers conducted a two-sample t-test. Lastly, to assess if lo-fi music affects memory retention, a two-sample t-test was performed as the two groups were composed of different participants and the data is continuous (McDonald, 2017).

Table 1. Age Demographics of Freshmen Students

Age	Frequency	Percentage
18	87	58
19	53	35.3
20	8	5.3
21	1	0.7
23	1	0.7
Total	150	100

Table 1 represents the breakdown of the participants' demographic profile. In terms of age, the majority are aged 18 with a frequency of n = 87 or 58%, followed by those who are 19, n = 53, 35.3%. Those aged 20 comprise 5.3% (n = 8) while 21 and 23 both are .7% with a frequency of n = 1. In total, there are 150 freshmen students.

Table 2. Course of Freshmen Students

Course	Frequency	Percentage
Nursing	86	57.3
MedTech	64	42.7
Total	150	100

Table 2 represents the demographic of courses: those studying nursing compose most of the participants at 57.3% with a frequency of n = 86 while the MedTech program comprises 42.7% or n = 64.

IV. RESULTS

Table 3. Independent t-test of memory retention between without and with lo-fi music.

Memory Retention	M	SD	df	t	*p*	Cohen's d	Decision
Without Lo-Fi Music	6.421	2.64	148	-3.213	.002**	-0.525	Reject
With Lo-Fi Music	8.5	4.966					

Note. ** indicates p < .01. M and SD represent mean and standard deviation, respectively.

To explore the effect of the presence of lo-fi music on memory retention, an independent samples t-test was conducted. The findings reveal a statistically significant difference as those exposed to lo-fi music scored higher in the test for memory retention, t(148) = -3.213, p = .002.

The researchers observed a significant difference between the memory retention of students exposed to lo-fi music and the default classroom noise. With these results, the study rejects the null hypothesis of lo-fi music having no significant effect. This can be attributed to the positive effects

of lo-fi music on one's physiological state (Kirk et al., 2021), attention, mood, and focus (Ázmi et al., 2023; Kirk et al., 2021).

V. DISCUSSION

Lo-fi music rapidly gained popularity during the COVID-19 pandemic to aid relaxation and focus. With younger students being more likely to listen to music while studying, there became a precedent to examine the influence of lo-fi music on memory retention. The research was guided by the theory of the Mozart Effect, which proposed that music had a temporary boost to one's cognitive processes. The ages of the participants ranged from 18 to 23 years old, with the majority being 18 years old. More than half of the participants came from the nursing program. Participants in the medical technology program had a higher average memory retention than those in the nursing program in both rooms with and without lo-fi music. Between the two programs, the participants in the medical technology program scored significantly higher on the test compared to the nursing program students when exposed to lo-fi music. Participants who were exposed to lo-fi music scored higher on the test for memory retention.

VI. CONCLUSION

Despite divisive results of previous studies, the researchers were able to conclude that lo-fi music had a positive effect on one's memory retention, with the MedTech program scoring higher than the nursing program among those exposed to lo-fi music. Lo-fi music is chosen over other genres for its relaxing and predictable quality, which has been corroborated through research and has previously been found to aid in one's attention and stress.

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