

# Perceived Stress and Memory Performance: A Correlational Study among Students taking Undergraduate and Vocational Program during Online Learning in Luzon, Philippines

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## Abstract

The current study explored that student are becoming more stressed due to various increases in academic demands and competitiveness, and life stress exposure has been correlated to impaired long-term and working memory performance, as well as an increased prevalence of self-reported memory problems. A sample of 180 was taken from different universities located in Luzon, Philippines. This study aims to determine the correlation between perceived stress and memory performance of students taking Undergraduate and Vocational Program during Online Learning, and the impact of demographic variables such as age, gender, year level, and program to these two parameters. The researchers used a 90% confidence interval and employ self-administered ergonomics tools including Perceived Stress Scale (PSS) to assess and quantify students' perceived stress levels, and the Everyday Memory Questionnaire (EMQ-R) to evaluate and measure respondents' memory performance in everyday life. According to the study's findings, vocational students face moderate stress compared to undergraduate students, which affects the majority of vocational students' memory performance. Additionally, the correlation coefficient for undergraduate programs is determined to be  $r=0.076$  indicating no relationship between the two variables, while there's a weak correlation of the two variables on vocational programs which results in  $r=0.243$ .

## Keywords

Perceived Stress, Memory Performance, Correlation, Ergonomics, Online Learning

## 1. INTRODUCTION

This chapter presents the overview of the study pertaining to the correlation of perceived stress and memory performance of students taking Undergraduate and Vocational programs. This also includes the problem statement, objectives, scope and limitations, and the significance of the study.

### 1.1 Background of the Study

In recent years, stress has become a global problem faced by human beings at all stages of their life. It represents a serious problem and affects their lifestyle (Alzyoud, A., et al, 2021). Stress is an internal state created by perceived physical demands on the body that are deemed to be potentially damaging, out of control, or beyond the individual's coping skills (Guruprakash & Patra, 2018). Stressors are stressful events that can affect a person's physical or mental health (Kwaah, C. Y., & Essilfie, G, 2017). Course load, sleep problems, and social activities were the major source of stress affecting the academic performance of undergraduate students. Stress is common in our everyday lives and has a major impact on our feelings, perceptions, and actions. Although stress can be beneficial to students depending on their personalities, negative stress has a detrimental effect on their performance and health (Rizwana

Bashir, E. S. et al., 2014). In nutshell, perceived stress was found to be an important factor that needs university administration, faculty, and parents to focus on effective psychoanalysis services along with stress management programs that could be useful for achieving academic success (Vogel & Lars, 2016). It is a critical challenge among students because it causes poor academic performance, anxiety, depression, and other health problems (Brough, 2015). The assessment of stress levels is important because this is the basis for the timely intervention particularly if the level of stress is high (Gazzaz, et al., 2018). Perceived Stress Scale (PSS) is one of the tools in measuring the respondents' perceived stress, whose scale contains direct queries concerning current levels of experienced stress (Andreou, E., et al., 2011). One main part of research that is related to stress in students has focused on understanding the situations related to reported stress and how these students cope up when feeling stressed. Overall, the students who are good with coping and time management skills, or who participate in a variety of extra-curricular activities report being less stressed than their peers (Sawatzky, et al., 2012).

Memory is vital to human cognition. Daily, everyone must efficiently maintain and update the information to complete tasks like following a conversation or directions (Loaiza & Lavila, 2021). This vital tool is described as the ability to hold and alter information in the mind for a short period, commonly known as "short-term memory." The process of comprehending concepts is more difficult for students who have working memory issues. They struggle with timed activities and rapid information delivery. With that, they end up experiencing frustration and abandoning the tasks (Tariq, et al., 2012). Working memory and academic achievement are significantly linked. Working memory is not a measure of intelligence but a unique cognitive capacity associated with academic performance. The recent study provides data to support that working memory plays an essential role in student learning over time. As a result, early assessment for the student's working memory profile can detect strengths and weaknesses, leading to effective management and support for academic success (Alloway, T., P., & Alloway, R., G., 2010). The Multifactorial Memory Questionnaire (MMQ) can be utilized to measure and assess self-perception of everyday memory ability. The questions are rated on a 5-point Likert scale based on the respondents' experiences over the previous two weeks (Angela, T. K. et al., 2018).

Perceived stress is a component of the stress response that causes emotional, physiological, or behavioral responses that are associated with a higher risk of cognitive impairment (Munoz, E., et al, 2015). Stress can affect cognitive abilities such as learning and memory (Vogel & Schwabe, 2016). On the other hand, recent life stress exposure was associated with impaired long-term and working memory performance, as well as with an increased prevalence of self-reported memory problems (Grant S. Shields, et al., 2017). Typically, emotionally exciting events are very well remembered and individuals with great stress events may also have very vivid recollections of these events, suggesting that intense stress during or before encoding may increase the formation of memories (Vogel & Schwabe, 2016).

In learning situations, some stress is anticipated and normal but excessive worry and stress harm cognitive performance, mainly working memory, concentration, and sustained attention that can affect college students. Students are becoming more stressed due to increased competition and higher expectations for academic excellence. Stress affects memory formation, making it more challenging to form short-term memories and convert them to long-term ones, making learning more difficult (Elizabeth Scott, M., 2021). Working memory is now recognized as a critical component of multitasking and later found that working memory explained more variance in multitasking than other cognitive, personality, and experience-based variables (Redick, T. S., 2016). Studies have shown that stress interferes with a student's concentration capacity, contributing to significant health issues, attention loss, and poor academic performance (Blackburn, 2020). Recent evidence further indicates that stress may hamper the updating of memories in the light of new information and induce a shift from a flexible, cognitive form of learning towards rather rigid, habit-like behavior (Zia-ur-Rehman, N. T., 2012). The connection between the stressful situation and the learning material is another aspect that moderates the influence of stress on learning (Vogel & Schwabe, 2016). As pandemic COVID-19 happened, it changed and affected people's lives. Due to this, all educational institutions worldwide have been closed to prevent the disease from spreading, directly affecting students, educators, and institutions. Hence, learning is the most affected aspect of the world because of the government's lockdown, which shifts to distance learning or e-Learning (Alzyoud, et.al, 2021). Thus, educational institutions decided to take online classes, affecting students' lives and attitudes towards education (Raj, U., & Fatima, A., 2020). In this case, when implementing e-learning, teachers must use a blended learning (BL) approach rather than pure online learning (OL). The abrupt change from a physical to a virtual classroom is upsetting students. (Chandra, 2020). Furthermore, it appears that some students struggle to adjust to the structure of online courses, manage their time in such settings, and maintain self-motivation (Tsai, Shen, & Tsai, 2011).

Therefore, this study is designed to examine the correlation between perceived stress and memory performance among the students taking undergraduate and vocational programs during online learning.

## 1.2 Statement of the Problem

This study aims to determine the correlation between perceived stress and memory performance of students taking up Undergraduate and Vocational Programs during Online Learning in Luzon, Philippines. Specifically, this study will seek to respond to the following questions:

1. What is the profile of the respondents in terms of sex, age, year level, and program?
2. What is the perceived stress level of the respondents?
3. What is the memory performance of the respondents?
4. Is there a relationship between the perceived level of stress of respondents in terms of age, gender, and year level?
5. Is there a relationship between the memory performance of respondents in terms of age, gender, and year level?
6. Is there a relationship between perceived stress and the memory performance of the respondents?
7. Is there a significant difference between the perceived level of stress and the program of the respondents?
8. Is there a significant difference between the memory performance and the program of the respondents?

## 1.3 Scope and Limitations

This study will limit its focus in determining the correlation between perceived stress and memory performance among students currently taking undergraduate and vocational programs. With the use of engineering tools and statistical tools, the results of this study will contribute to the focus and comfort of the students in enhancing their performance. The instruments used include several direct queries about current levels of experienced stress and assess various elements of self-reported memory, such as memory satisfaction, self-assessment of memory ability, and compensatory technique utilization. Furthermore, the researchers will provide solutions using the cognitive method rather than medical treatment, and only the factors of stress and student memory performance will be considered.

## 1.4 Significance of the Study

This study focuses on identifying the correlation between perceived stress and memory performance and how these two affect the students' academic performance taking undergraduate and vocational programs during Online Learning in Luzon, Philippines. Moreover, the results of this study will be beneficial to the following:

**Students.** This study will help undergraduate and vocational students and other students become more aware of how stress might impair memory performance when doing academic activities and daily duties. This research also teaches students about the stressors or reasons for their stress and how to lessen it to accomplish their everyday activities effectively and efficiently.

**Industrial Engineering Department.** This research will also benefit the Industrial Engineering Department since it will make them better aware of students' conditions and circumstances during virtual sessions. This can also assist the department in determining how they will respond and pay attention to this issue to raise awareness of how stress can negatively impact students' physical performance, psychological well-being, and health.

**Parents.** The study will allow parents to assist, assess, and counsel their children on managing stress, ensuring that their child's academic performance, mindfulness, and health are not harmed.

**Philippine Literature.** This study may contribute as additional knowledge and reference to Philippine literature as the relationship between perceived stress and memory performance among undergraduate and vocational students during online learning has not been investigated.

**Future Researchers.** The study's findings will be used as a reference and a guide for future researchers who plan to conduct the same experimental study, or any study relevant to this topic, the correlation of perceived stress and memory performance of undergraduate and vocational program students.

## 1.5 Theoretical and Conceptual Framework

The conceptual framework below implies a visual representation of an expected relationship between variables which are perceived stress and memory performance of Undergraduate and Vocational students.

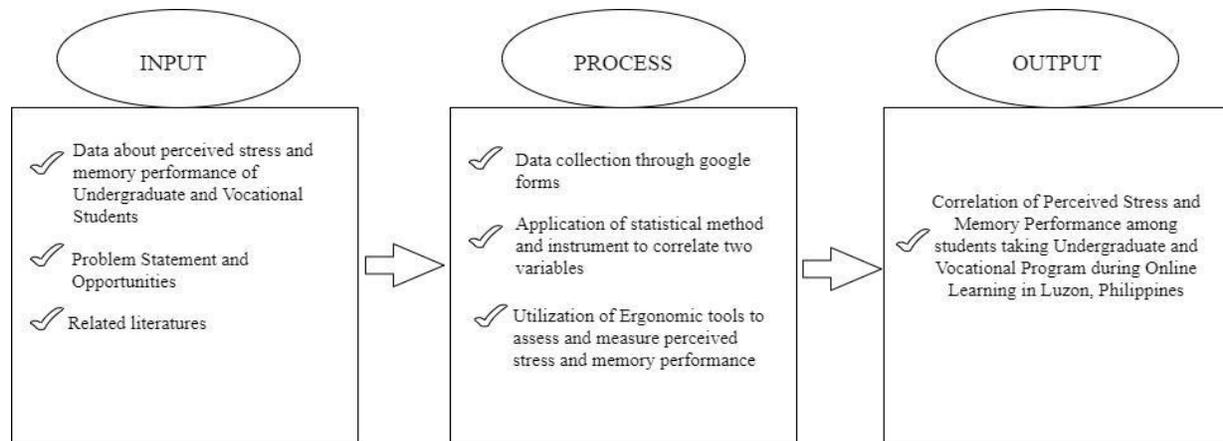


Figure 1. Conceptual Framework

The figure illustrates the input-process-output process, which indicates the tools and requirements that the researchers formulated to measure the correlation of perceived stress and memory performance of undergraduate and vocational students during online learning by employing statistical methods and instruments, as well as ergonomic tools.

## 2. METHODOLOGY

The research design, participants and sampling technique used, research instrument, data gathering procedure, and data analysis are presented in this chapter.

### 2.1 Research Design

The nature of this study is quantitative. Quantitative methods emphasize objective measurements and the analysis, by means of surveys, statistical, mathematical, and numerical analysis, or by using computational techniques to control pre-existing data. Quantitative research focuses on collecting and generalizing numerical data across groups of people or explaining a specific phenomenon (Babbie, 2010).

This is a quantitative design correlation type. Correlational research is a kind of research method which involves the observation of two variables to establish a statistically relevant relationship. Correlation research aims at identifying variables that have some sort of relationship as long as changes in one create changes in the other (Mertler, 2018).

### 2.2 Participants and Sampling Technique

The respondents are students taking Undergraduate and Vocational Program during Online Learning in Luzon, Philippines. The researchers used the survey questionnaires from ergonomic tools such as the Perceived Stress Scale (PSS) and Everyday Memory Questionnaire-Revised (EMQ-R) and administered them to the respondents through google forms.

The sampling technique used is simple random sampling, in which Each component in the sample has an equal probability of being included in the sample (Lavrakas, P. 2011). For the School Year 2020-2021, the overall population of enrolled Undergraduate Students from Luzon, Philippines, is 2,025,849. The overall population of enrolled Vocational Students from the same area is 411,472 for the year 2020. The researchers used Cochran's formula to calculate an ideal sample size for this study, given a desired level of precision, desired confidence level, and the expected attribute proportion present in the population. The computed sample size using 90% confidence interval and 10% margin error based on Cochran's formulation is 68. The researchers collected a total of 180 responses, which is more than the computed sample size, but then considered all responses to be analyzed using Minitab since, according to a published study, low statistical power can be attributed to insufficient sample size or other design concerns (Singh, A. S., & Masuku, M. B., 2014).

### 2.3 Research Instrument

#### a. Perceived Stress Scale (PSS)

The Perceived Stress Scale (PSS) comprises direct queries to evaluate and quantify the perceived stress levels. The following questions were designed to demonstrate how unpredictable, unmanageable, and

overburdened respondents' lives are. These are simple to comprehend, and the response options are unambiguous. Additionally, the PSS questions inquire about feelings and ideas from the previous month, and in each scenario, respondents are asked how frequently they felt a particular way. The PSS demonstrated adequate reliability and as expected, was related to life-event ratings, depressive and physical symptomatology, health-care utilization, and social anxiety (Cohen, S., Kamarck, T., & Mermelstein, R. 1983).

The computed scores for PSS were first to reverse the respondent's scores for questions 4, 5, 7, and 8. On these 4 questions, change the scores like this: 0 = 4, 1 = 3, 2 = 2, 3 = 1, 4 = 0. After, get the total scores for each item (Cohen 1994). Individual scores on the PSS range from 0 to 40 with higher scores indicating higher perceived stress.

Table 1. Perceived Stress Scale (PSS) Interpretation

Score (range)	Interpretation
0 to 13	Low stress
14 to 26	Moderate stress
27 to 40	High perceived stress

The table above shows the scoring interpretation of PSS, with scores ranging from 0 to 40 indicating low perceived stress to high perceived stress.

**b. Everyday Memory Questionnaire-Revised (EMQ-R)**

The Everyday Memory Questionnaire-Revised (EMQ-R) is a 13-item scale intended to measure memory failure in everyday life. The weak relationship between memory tests and performance may be due to discrepancies between ordinary tasks and the abilities tested by memory tests (Stančić, Dimitrijević, & Subotić, 2018). As a result, the EMQ-R total score is calculated by adding all components and looking for its mean.

Calculating the respondents' scores with EMQ-R is based on a mean of all 13 items and has two subscales Retrieval (7 items) and Attentional Tracking (4 items), with two items that are added only when a total score is used (Royle & Lincoln, 2008). The EMQ-R is scored on a 5-point scale (from "0 = Once or less in the last month." to "4 = Once or more in a 10 day."

Table 2. Everyday Memory Questionnaire-Revised (EMQ-R) Interpretation

Scale	Range (mean)	Interpretation
1	1.00 - 1.49	Highly Acceptable
2	1.50 - 2.49	Acceptable
3	2.50 - 3.49	Moderately Acceptable
4	3.50 - 4.49	Fairly Acceptable
5	4.50 - 5.00	Not Acceptable

The table above shows the scoring interpretation for Everyday Memory Questionnaire-Revised (EMQ-R) using the Likert Scale, ranging from 1 to 5 interpreted from highly acceptable to not acceptable.

**c. Google Forms**

Google Forms is a web-based tool and survey management software that enables users to create forms for data collection purposes. The data gathered can be input into a spreadsheet automatically. The researchers will prepare Google Forms as survey questionnaires to be answered by the respondents for the data gathering procedure.

## 2.4 Data Gathering Procedure

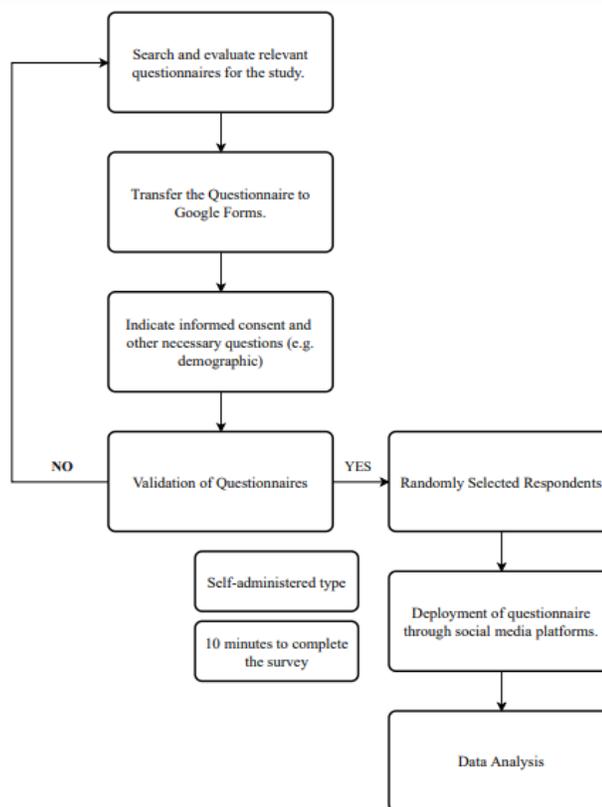


Figure 2. Data Gathering Procedure

The figure illustrates the data gathering process in collecting the data of the respondents enrolled in undergraduate and vocational programs. To analyze the data, the researchers search and evaluate the questionnaires for this study which are the Perceived Stress Scale (PSS) and Everyday Memory Questionnaire-Revised (EMQ-R), if the questionnaires were already validated, the researchers can deploy the questionnaire through social media platforms. The questionnaires that will be deployed to respondents are the self-administered type that will take approximately 10 minutes to complete. After data collection, the researchers will proceed to data analysis.

## 2.5 Data Analysis

The following statistical methods will be used to interpret the data gathered from the respondents:

### a. Statistical program

The Minitab software is a command- and menu-driven statistical analysis software package developed by researchers Brian L. Joiner, Barbara F. Ryan, and Thomas A. Ryan, Jr. in 1972 at the Pennsylvania State University. This software tool will be used in statistical computation and analysis of the gathered data to determine if perceived stress and attention are correlated with each other.

### b. Spearman correlation

The Spearman correlation is a statistical method for determining the strength and direction of association between two ranked variables (Glen, 2021). In this study, Spearman correlation will help in the evaluation of the strong relationship between perceived stress and memory performance among the students taking Undergraduate and Vocational Program. Minitab 19 will be used to examine the relationship between perceived stress and memory performance from the gathered data. The null hypothesis (H0) and alternative hypothesis (H1) for the study will be written as follows:

H0: there is no correlation between two variables; H1: there is a correlation between two variables.  
if  $p\text{-value} > \alpha (0.10)$ , accept the H0; if  $p\text{-value} < \alpha (0.10)$ , reject the H0.

**c. Two sample T-test**

According to Kiebel, S. J., and Holmes, A. P., a two-sample t-test is a method for determining if two groups' unknown population means are equal. This will determine the significant difference between perceived stress and memory performance among students taking undergraduate and vocational programs with the use of Minitab 19.

**3. RESULTS**

This section evaluates and interprets the data collected using a statistical test to determine the correlation of perceived stress and memory performance of students taking Undergraduate and Vocational programs.

**3.1 Profile Percentage of the Respondents**

Table 3. Profile of the Respondents

<b>SEX OF THE RESPONDENTS</b>	
Female	58.9%
Male	41.1%
<b>AGE OF THE RESPONDENTS</b>	
18-20	26.6%
21-23	67.2%
24-26	6.1%
<b>PROGRAM OF THE RESPONDENTS</b>	
Undergraduate	50%
Vocational	50%
<b>YEAR LEVEL OF UNDERGRADUATE STUDENTS</b>	
1st Year	15.6%
2nd Year	12.2%
3rd Year	18.9%
4th Year	52.2%
5th Year	1.1%
<b>YEAR LEVEL OF VOCATIONAL STUDENTS</b>	
1st Year	41.1%
2nd Year	58.9%

The table shows the collected profile of the respondents taking Undergraduate and Vocational Programs residing in Luzon, Philippines. It resulted that most of the respondents are female with ages ranging from 21-23 years old. Both programs have an equal population; The majority year level for Undergraduate programs are 4th-year students while 2nd-year students are the majority year level for the Vocational program.

**3.2 Perceived Stress Level of Respondents**

Table 4. Perceived Stress Level of Respondents

<b>Frequency</b>			<b>PSS Score</b>	<b>Interpretation</b>
<b>Undergraduate</b>	<b>Vocational</b>	<b>Total</b>		
63	79	142	14-26	Moderate Stress
24	11	35	27-40	High Perceived Stress
3	0	3	0-13	Low Stress

The table above shows the measure of perceived stress level of respondents using the Perceived Stress Scale (PSS). It results that 63 undergraduate students experienced moderate levels of stress, 24 high perceived stress, and 3 of them reported low levels of stress during online learning. On the other hand, 79 vocational students indicated moderate levels of stress, 11 high perceived stress, and no records in low-level stress. Therefore, the researchers found out that most vocational students are experiencing moderate stress compared to undergraduate students.

### 3.3 Memory Performance of Respondents

Table 5. Memory Performance of Respondents

Frequency			EMQ-R Score Range (mean)	Interpretation
Undergraduate	Vocational	Total		
2	0	2	1.00 - 1.49	Highly Acceptable
11	5	16	1.50 - 2.49	Acceptable
47	34	81	2.50 - 3.49	Moderately Acceptable
27	32	59	3.50 - 4.49	Fairly Acceptable
3	19	22	4.50 - 5.00	Not Acceptable

The table above shows students' memory performance frequency, interpreted using the Likert scale, for undergraduate and vocational students. According to the results of this study, there are 47 undergraduates and 34 vocational students with moderately acceptable memory performance, 27 undergraduates, and 32 vocational students with reasonably acceptable memory performance. Only 11 undergraduate and 5 students in the vocational programs have satisfactory memory performance. In comparison, 2 of undergraduate students have a highly acceptable memory performance as 22 students in the undergraduate and vocational programs have unacceptable memory performance. Therefore, the researchers indicate that most students from vocational and undergraduate programs have a moderately acceptable level of memory performance.

### 3.4 Relationship between Perceived Stress and Respondents Profile

Table 6. Pairwise Spearman Correlation of Perceived Stress in terms of Demographics of the Respondents

Sample 1	Sample 2	P-value	
		Undergraduate	Vocational
Year Level	PSS Score	0.018	0.167
Age	PSS Score	0.273	0.348
Sex	PSS Score	0.011	0.284

The table above shows the relationship between perceived stress and the demographic profile of undergraduate and vocational students. It indicates that the undergraduate PSS score is statistically significant regarding year level and gender of respondents, with p-values of 0.018 and 0.011, respectively. Furthermore, there is no statistically significant relationship between the vocational student's PSS score and their demographic profile.

### 3.5 Relationship between Memory Performance and Respondents Profile

Table 7. Pairwise Spearman Correlation of Memory Performance in terms of Demographics of the Respondents

Sample 1	Sample 2	P-value	
		Undergraduate	Vocational
Year Level	EMQ-R Score	0.517	0.264
Age	EMQ-R Score	0.212	0.615
Sex	EMQ-R Score	0.650	0.772

The table above indicates the correlation of memory performance in terms of the demographic profile of undergraduate and vocational students. It represents that the EMQ-R score of undergraduate and vocational students is not statistically significant with year level, age, and sex of the respondents since the resulting p-values for both variables are greater than 0.10.

### 3.6 Relationship between Perceived Stress and Memory Performance

Table 8. Spearman Correlation between Perceived Stress and Memory Performance

Program	Sample 1	Sample 2	Correlation (r)	P-value
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Undergraduate	EMQ-R	PSS Score	0.076	0.478
Vocational	EMQ-R	PSS Score	0.243	0.021

The table above shows the correlation between perceived stress and memory performance for undergraduate and vocational programs. It indicates that for the undergraduate program the correlation ( $r$ ) is 0.076 which implies that there is no or negligible relationship between the variables perceived stress and memory performance. On the other hand, it also shows that correlation ( $r$ ) is 0.243 for vocational program implying that there is a weak correlation between the variables perceived stress and memory performance.

### 3.7 Significant Differences between Perceived Stress and Programs

Table 9. Two Sample T-test of PSS Score and Programs

T-value	DF	P-value
0.17	154	0.866

The table above shows the results of two-sample t-tests of PSS score and programs. In the results, the p-value is 0.866, which is greater than the significance level of 0.10, the decision is to accept the null hypothesis and conclude that perceived stress and program is not statistically significant.

### 3.8 Significant Differences between Memory Performance and Programs

Table 10. Two Sample T-test of EMQ-R Score and Programs

T-value	DF	P-value
-3.85	174	0.000

The table above shows the results of two-sample t-tests of EMQ-R score and programs. In the results, the p-value is 0.000, which is less than the significance level of 0.10, the decision is to reject the null hypothesis and conclude that there is a significant difference between memory performance and program.

## 4. DISCUSSION

This chapter contains a thorough discussion of the results as well as a summary of findings generated by the Minitab 19 Software. It also contains a conclusion and recommendations based on the study's findings.

### 4.1 Summary of Findings

The researchers employed two (2) survey questionnaires for the respondents, the Perceived Stress Scale (PSS), to evaluate the felt stress of respondents, and the Everyday Memory Questionnaire-Revised (EMQ-R) to evaluate the respondents' memory performance. The tests' calculated results were analyzed. The following results have been obtained:

- 1) The researchers discovered that most of the respondents are females between the ages of 21 and 23. Both programs have an equal population; 4th-year students make up most of the Undergraduate program, while 2nd-year students make up most of the Vocational program.
- 2) The researchers discovered that most respondents are experiencing moderate stress because of the online learning environment, with vocational students reporting higher levels of moderate stress than undergraduate students.
- 3) The researchers discovered that most respondents have an acceptable memory performance, with undergraduate students performing better than vocational students.
- 4) The researchers found that the year level and sex of the undergraduate students are statistically significant to their PSS Scores however their age is not statistically significant to their PSS scores. Additionally, the vocational students' year level, age, and sex are not statistically significant to PSS scores.
- 5) The researchers found that the year Level and EMQ-R scores of the undergraduate students are statistically significant while, the undergraduate students' age and sex are not statistically significant to their EMQ-R scores. On the other hand, the vocational students' year Level, age, and sex are not statistically significant to their EMQ-R Scores.

- 6) The researchers found that the PSS and EMQ-R scores of undergraduate students have a negligible relationship while the PSS and EMQ-R Scores of vocational students show a weak relationship.
- 7) The researchers found that using two-sample t-test perceived stress and programs is not statistically significant as p-value is greater than the level of significance thus, the decision is failed to reject the null hypothesis.
- 8) The researchers found that using two-sample t-test there is a significant difference between memory performance and programs as p-value is less than the level of significance thus, the decision is to reject the null hypothesis.

These findings summarize the key findings of a study on Perceived Stress and Memory Performance, which discovered that the two variables have little to no correlation. These condensed findings aid in the comprehension of the methodology used by researchers to collect and compute research data and findings.

## 4.2 Conclusion

The purpose of this study was to evaluate the hypothesis that perceived stress and memory performance are associated with each other in terms of age, sex, program, and year level of the students under online learning. The researchers have found that most vocational students are experiencing moderate stress compared to undergraduate students during online learning which impacts their everyday memory performance, with a moderately acceptable memory failure and a p-value of 0.021. As a result, the researchers concluded that the correlation (r) value between perceived stress and memory performance for vocational students has a high value yet indicates a weak relationship, as opposed to the correlation value for undergraduate students, which indicates no or negligible relationship.

Moreover, the researchers analyze and evaluate the significant differences between perceived stress and programs and significant differences between memory performance and programs. Based on the result, perceived stress and programs is not statistically significant while there is a significant difference between memory performance and programs.

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