Original Research Article

The Influence of Social Facilitation on Test Performance

ABSTRACT

Aims: This study aims to explore the influence of social facilitation on test performances of the first year BS in Psychology students.

Place and Duration of Study: University of Mindanao Digos College, Department of Arts and Sciences, BS in Psychology Program, from November to December 2024.

MethodologyParticipants of the study were first year psychology students (N=40) of the University of Mindanao Digos College. They were selected through a short survey and receiving an academic distinction award with honors upon their senior high school graduation were the primary qualification regardless of their gender and age. Twenty students (16 females; 2 males) undergo the solo study condition and another twenty students (19 females; 1 male) undergo the peer group study condition.

Results: Results showed no statistically significant difference in test performance between the two study methods ($p < .05$), as indicated by independent samples t-test and Mann-Whitney U test. Solo study participants demonstrated a slightly higher mean improvement ($M = 6.00$) compared to group study participants ($M = 5.50$), but the effect size ($i = 0.212$) indicated minimal difference.

Conclusion: Both study methods are equally essential to college students in improving their test performance. Results stated that there are no statistically significant difference between the peer study group and solo study condition.

Keywords: Social Facilitation, Test Performance, Solo Study Method, Group Study Method

1. INTRODUCTION

Does the presence of a peer group make an individual perform better than he may do so while alone? Or studying alone results in higher test performance than collaborating with a peer group? Social facilitation is a long-standing psychological study issue with a variety of findings that has given significant impact within educational settings including regarding students' ways to learn (Steenberghs et al., 2021). It is thought that task complexity determines whether performance on cognitive or motor activities is aided, hindered, or unaffected (Meurs et al., 2022). In a study of Li et al., (2024), the study highlighted the

impact of peer group study in an anatomy small group curriculum, which reveals that their average quiz scores significantly improved even without the need for extra preparation time.

The fact that there are tasks that were divided into individual and group work provides a good background for analyzing the impact of the social factor on the test result. Goldhaber & Özek (2019) stated that test performance among college students is a focus in educational research because it directly affects the future career opportunities and personal growth of the students. Among the many factors that influence test performance, the method of study used by the students is one of them (Bayih, 2019). There are actually differences in how they approach information processing and collaborative learning with peer study groups and solo study.

One of the features of studying in solitary is that a person can determine the process independently or at least independently choose the task priorities, pace, and subjects that are difficult for him (Kerr & Spinney, 2023). It also promotes an individual's accountability and more self direction in the learning process because it emphasizes on self – regulated learning (Khairudin et al., 2020). On the other hand, group study incorporates aspects of teamwork whereby participants share information, clear their misunderstanding and may be put under pressure (SkillWisePro, 2024). According to London School of Economics and Political Science (2019) ,peer study groups are highlighted as an effective strategy in fostering a strong sense of belonging within the institution. Nevertheless, the social side of group study can also introduce distractions, or produce pressure that affects the cognitive process (Steenberghs et al., 2021).

Many researchers have shown in their previous studies that either a solo study or peer study has its own different importance in test performance and have been seen to be effective with varying results depending on the type of study. Ohood (2024) states that both group study and individual study have their own set of advantages that are essential in having been able to accomplish the task, whichever the case may be. Group study has the potential of eliciting diverse views, extra motivation, and learning interactions but individual study has its advantages too as it allows for time management, learner control, and individual focus (Ohood, 2024). According to Mitchell (2024), an effective preparation strategy involves a balanced approach that integrates the advantages of both group study and individual study methods.

In regard to the two positive sides of the two techniques, it is not known so far whether one of them demonstrates statistically better test pitching than another and why. Although each has their own merits, little is known about which method is more effective at enhancing test performance among college students. There are still existing issues regarding the relationships between the task characteristics, the individual learning preferences, and the social factors. This current study attempts to focus on the effectiveness of peer study in comparison to solo study in the hope to fill the void that lies in these two variables.

This study seeks to compare the impact of solo study and group study conditions on the test performance and analyze the extent score variation between the two above said methods, and evaluate the overall similarity in score and the distributions between the two methods.

In this study, the hypothesis focuses on exploring the impact of social facilitation on test performance of students. The null hypothesis states that studying alone or studying with a peer group does not have a significant effect on student's test performances. By testing this hypothesis, the study aims to answer the following questions:

1. Are solo study and group study equally effective?
2. Is there a significant difference between solo study and group study?

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2. METHODOLOGY

2.1 Participants

The participants of the study were first year psychology students (N=40) of the University of Mindanao Digos College. They were selected through a short survey and receiving an academic distinction award with honors upon their senior high school graduation were the primary qualification regardless of their gender and age. Twenty students (16 females; 2 males) undergo the solo study condition and another twenty students (19 females; 1 male) undergo the peer group study condition.

2.2 Procedure and Design

The study utilized the pretest, treatment, posttest design. Before the experiment prior, testing environment, test duration, and baseline of knowledge were controlled. The participants were provided with a quiet and comfortable atmosphere to minimize external distractions. Both groups were engaged in their respective treatment conditions for the same length of time (15 minutes). A balanced baseline knowledge was given through a pretest. The data of the study were collected through three stages.

During the pre-intervention setup, the participants were selected by running a short survey to gather first year student's academic awards received upon their senior high school graduation. Forty participants were successfully selected and were randomly assigned to receive either solo or group treatment conditions.

The data collection from the initial twenty students who were assigned to the group study treatment was the first stage of the study. To set the baseline of their knowledge, a thirty item identical pretest was administered. They were given a duration of fifteen minutes to complete the test individually.After collecting their papers, they were divided into five groups with five members each then separated from one another to avoid unnecessary distractions. Another fifteen minutes were allotted for them to study the study material related with the chosen topic–Philippine history. They were instructed and encouraged to discuss and cooperate with their group members. The study materials were taken away then another fifteen minutes was set for them to complete the thirty items posttest individually. Finally, the papers were collected and successfully debriefed about the research.

The second stage was to gather data from the last twenty students who were assigned to receive the solo study treatment. In order to set a baseline of their knowledge, they were provided with a fifteen minute duration in which they had to complete a thirty items identical pretest. After collecting their papers, they were also provided with another fifteen minutes to study the same study materials that concerned the chosen topic–Philippine history. The study materials were then taken away and replaced by the thirty item posttest questionnaire which the students were given fifteen minutes to finish. Finally, the papers were collected and successfully debriefed them about the study.

Examining their papers was the experiment's last stage. After gathering the result of the pretest and posttest from both solo and group study conditions, pretest scores were subtracted from their posttest score to determine the difference scores. To finally determine whether there is a statistically significant

difference between the two treatment conditions, the data was lastly arranged in an Excel spreadsheet and then entered into statistical software.

Our study focuses on the comparison between the effectiveness of peer group study and solo study that was undertaken through tests. Thus, we used a quantitative-comparative experimental design to enable the systematic manipulation and comparison of two independent variables. This type of intervention is appropriate as it responds to the research objectives as well which was concerned about the impact of social context on how effective the learning process is.

2.3 Instrument

The principal instrument used in this research study was a test questionnaire. That is, a general knowledge quiz on Philippine History that has been validated by licensed experts. Developed based on the standards and sources of educational references, with 30 multiple -choice questions, two of which had been used for content derivation are Durin (2019) & Dela Peña (2016).

The quiz was given as a pretest and posttest to measure the efficacy of the experimental technique and was done before and after the treatment conditions. Validation and expert consultation were made to ensure that the quiz was valid and reliable. In-person administration was done in a controlled environment to maintain uniformity and minimize distractions. In addition, participants were properly instructed and facilitated. This prevents help from external sources while further ensuring adherence to rules.

After the completion of the quiz, the responses collected were anonymized to protect participants' identities. Lastly, the data were kept in a secure setting and used only for research purposes.

2.4 Ethical Considerations

Ethical considerations are essential to ensure that the study is conducted responsibly, fairly, and with respect for all those who are involved. It protects the rights of the participants of the study and maintains the institution’s ethical standards throughout the study.

All participants will be given informed consent forms that explains the purpose of the study, the procedures involved, and any possible risks that they may encounter. Participation will be voluntary and they can withdraw at any time without consequences. To protect data privacy, all data will be kept confidential and stored securely, with no identifying information shared. At the end of the study, participants will take part in a debriefing session, where they can ask questions and learn about the findings.

Approval will be obtained from the subject instructor of the University of Mindanao Digos College, to ensure proper training for researchers, and adhere to the ethical standards in data collection, analysis, and reporting.

3. RESULTS AND DISCUSSION

Table 1. Normality Test

Normality Test (Shapiro-Wilk)

	W	p

Difference Score (Posttest - Pretest)	0.960	0.171

To check the normality of the collected data, the Shapiro-Wilk test is used. Table 1 shows a critical value W = 0.960 and a p-value of p = 0.171. This indicates that the difference scores are very likely to be normally distributed under the solo and group study conditions.

Table 2. Group Descriptives

Group Descriptives

	Group	N	Mean	Median	SD	SE
Difference Score (Posttest - Pretest)	**Solo**	20	6.00	6.00	2.99	0.669
	Group	20	5.40	5.50	2.66	0.596

Table 2 shows the descriptive statistics for the study, specifically the difference scores (posttest - pretest) between the solo and group study conditions.

The solo study condition showed a slightly higher mean difference score (M = 6.00, SD = 2.99, SE = 0.669) in contrast to the group study condition (M = 5.50, SD = 2.66, SE = 0.596).

In conclusion, the data of this study show that the solo study condition was higher than the group study condition in terms of test performances. However, the difference between the groups in terms of mean scores is minimal. The overall distribution of scores is similar between the two conditions, though the solo group demonstrates slightly more variation in their difference scores.

Table 3. Independent Samples T-test

Independent Samples T-test

		Statistic	df	p		Effect Size
Difference Score (Posttest - Pretest)	**Student's T**	0.670	38.0	0.507	Cohen's d	0.212
	Mann-Whitney U	162		0.304	Rank biserial correlation	-0.190

Note. H_a $\mu_{Solo} \neq \mu_{Group}$

Finally, Table 3 shows the Independent Samples t-test which indicates no statistically significant difference between the solo study and group study treatment conditions.

The Student's T-test reveals a t-statistic of 0.670, 38 degrees of freedom, and a p-value of 0.507, which is greater than the 0.05 significance level. Additionally, Table 3 also shows (Cohen's d = 0.212) which suggests that despite the data having a difference in means, it does not show any significance.

Mann-Whitney U test is also utilized in which it supports the findings of the Student's t-test. Table 3 shows a statistic of 162 and a p-value of 0.304, stating that there is no significant difference between

the both study conditions. The rank-biserial correlation is -0.190 which reflects a very small effect in terms of ranking the participants.

Consequently, the null hypothesis states that there is no significant difference in test scores between solo and group study conditions, thus was accepted.

This study sets out to explore whether studying in a peer group or solo holds the key to unlocking better academic performance among first year psychology students. The findings of this study continue the ongoing debate in the area of educational psychology that concerns the functionality of both treatment conditions in enhancing one's test scores. The result indicates that there is no statistically significant difference between the two conditions as shown by the Independent Samples t-test ($p = .507$) and also by the Mann- Whitney U test ($p = .304$). A study by Ali & Shah (2023) supports this result indicating there is no real correlation between social facilitation and performance and social facilitation may be impacted by a variety of factors, such as internal conflict or distraction, fear of audience evaluation, audience members of the opposite gender, negative mood, or an internal urge for performance. These findings suggest that while mean scores had slight differences, neither of the two conditions dominated nor helped in a learning task. The study of Goldhaber & Özek, 2019; and Ohood, 2024 is consistent with the finding of existing literature which provides mixed results that seems to propose that the effectiveness of learning strategies can be context based, depending on how complicated the task is and each individual's learning style.

In relation to this, Meurs et al. (2022) have pointed out, the finding of the current study could be explained by taking into consideration the task complexity. The quiz on Philippine history can be said to have posed a mild cognitive challenge, which was probably too mild to uncover any extreme difference between studying with a group or alone. However, research done by Steenberghs et al. In 2021 indicates that the simpler the task, the less a group study will assist its completion and on the other hand the more complex the task is, its completion may increase when problem solving is done together. On the one hand, independent study encourages and motivates the participant's social integration (London School of Economics and Political Science, 2019). The finding of no significant difference in this study implies that there were some participants who may not have experienced the benefits or drawbacks of each method, instead, they were static regarding the two methods. For instance, group participation may have included distractions that created pressure (Steenberghs et at., 2021) which would instead make up for the joys of learning together.

The limitations in this research can be traced first in its number of participants involved in the study, which was forty ($N = 40$), together with them being the same (they were all first year psychology students) who excelled in academics upon their senior high school graduation. The factors tend to limit the findings to particular situations, and not to be generalized.

Lastly, the treatment sessions were too brief when compared to the real life situation which could have affected the learning outcomes of the participants. Future studies could eliminate these weaknesses by increasing the sample size and include participants from a diverse program or academic backgrounds, on assessing how study methods impact task performance.

Moreover, implementing an integrated strategy combining both solo study and with peer group study may be much more effective. Engaging in a mixed approach that combines the self-discipline and concentration associated with solo study, while also seeking the drive and knowledge that studying with peers can provide could enhance students' test and possibly the overall academic outcome.

4. CONCLUSION

In this study, the researchers investigated the effects of peer group study and solo study methods on the test performance among first-year Psychology students at the University of Mindanao Digos College. The outcome did not appear to have any statistically significant difference between the peer study group and the solo study condition, as indicated in both independent samples t-test ($p = .507$) and Mann Whitney U test ($p = .304$). The null hypothesis stated that there were no notable distinctions between the two conditions, and it was deemed acceptable.

While the solo study condition showed a slightly higher mean difference score ($M = 6.00$) compared to the peer group study condition ($M = 5.50$), the effect size (Cohen's $d = .212$) and rank biserial correlation (-0.190) suggests that the difference is only minimal and lacks practical differences. Furthermore, the Shapiro-Wilk test confirmed the normal distribution of the data ($W = .906$, $p = .107$) which ensures the reliability of its findings.

Overall, results suggested that both peer group study and solo study methods are both equally effective in improving academic performance, with no single method showing a clear advantage.These findings highlighted the flexibility students have while choosing study technique that aligns their personal preference and their learning styles.

REFERENCES

Ali, S., & Shah., I. (2023). Examining the Impact of Social Facilitation on Performance: Insights from a Study with University Students at Karachi University. PriMera Scientific Engineering.

Bayih, A. (2019). The Effects of Teaching Methods on Students Test Scores: A Quasi Experiment. 3. 62-83.

Dela Peña, R. M. F. (2016). Philippines Quiz Questions. Scribd. https://www.scribd.com/document/294729929/Philippines-Quiz-Questions

Durin, R. (2019). Handout Test Questions Philippine History and Rizal. Scribd. https://www.scribd.com/document/423363233/ANSWER-KEY-HANDOUT-TEST-QUESTIONS-PHILIPPINE-HISTORY-AND-RIZAL-AND-OTHER-HER-doc

Goldhaber, D., & Özek, U. (2019, January 6). How much should we rely on student test achievement as a measure of success?

Kerr, S. E., & Spinney, J. E. L. (2023). Students' Perceptions of Choice-based Assessment: A Case Study. (23rd ed., Vol. 1). Journal of the Scholarship of Teaching and Learning. https://doi.org/10.14434/josotl.v23i1.31471

Khairudin, K., Suryani, K., Fauzan, A., & Armiati, A. (2020). Self Regulated Learning of Mathematics Education Students of Bung Hatta University. Journal of Physics: Conference Series. 1429. 012003. 10.1088/1742-6596/1429/1/012003.

Li, P., Asri, R., Holan, G., Traba, C., Chen, S., & Grachan, J. J. (2024). Anat Sci Educ. 2024;00:1–9. Effect of peer facilitation in anatomy small group curriculum on academic performance and retention: A pilot study. https://doi.org/10.1002/ase.2533

London School of Economics and Political Science. (2019). Quick Guide to Peer Study Groups.

Meurs, E. v., Greve, J., & Strauss, B. (2022). Moving in the presence of others – a systematic review and meta-analysis on social facilitation. International Review of Sport and Exercise Psychology. 10.1080/1750984X.2022.2111663.

Mitchell, M. (2024, June 4). Group Study vs. Solo Study: Which is Better for ASWB Exam Prep? Agents of Change.

Ohood. (2024, September 12). Group Study vs. Solo Study: Finding The Right Balance. https://education-today.co.uk/group-study-vs-solo-study-finding-the-right-balance/

SkillWisePro. (2024, October 13). The Benefits of Group Study vs. Solo Study. https://skillwisepro.com/benefits-of-group-study/

Steenberghs, N., Lavrijsen, J., Soenens, B., & Verschueren, K. (2021). Peer Effects on Engagement and Disengagement: Differential Contributions From Friends, Popular Peers, and the Entire Class. Frontiers. https://doi.org/10.3389/fpsyg.2021.726815

APPENDIX A

Three Experiment Requirements

The Influence of Social Facilitation on Test Performance

Experiment on The Effect of Study Method (Peer Study Groups vs. Solo Study) on Test Performance of College Students

Objective: To determine the impact of study methods (studying in peer groups vs. solo study) on the test performance of college students, aiming to determine which method is more effective in enhancing learning outcomes.

Hypothesis:

- **Null Hypothesis (HO):** Studying alone nor studying with a peer group does not have any effect on the test performance of the students.
- **Alternative Hypothesis (H1):** Study methods (studying with peer group vs. studying solo) have a significant effect on the test performance of the students.

I. **Participants:**
   - **Sample Size:** 40 college students (mixed gender) enrolled in the same program.
   - **Inclusion Criteria:** Healthy students with no existing and pre-existing diagnosis of mental retardation condition and received academic distinction with honor during their senior high school graduation.
   - **Exclusion Criteria:** Students who are mentally impaired and are diagnosed with mental retardation.

II. **Independent Variable:**
   - **Group A (Experimental Group 1):** Participants will engage in **Group Study**, guided by the facilitator.
   - **Group B (Experimental Group 2):** Participants will engage in **Solo Study** independently, without external guidance.

III. **Dependent Variable:**
   - **Test Performance:** Measured by comparing **pretest and posttest scores** on an academic assessment directly relevant to the course or subject material studied.
     1. Pretest: Administered before the study session.
     2. Posttest: Administered after the study session to measure any improvement in understanding.

IV. **Control Variables:**
   - **Testing Environment:** The experiment will be conducted in a quiet, comfortable room to minimize external distractions.
   - **Test Duration:** Both groups will engage in their respective treatment conditions for the same length of time (30 minutes).
   - **Time of Day:** All participants will be tested on the same day but not on the same time to avoid interference effects and ensure adequate space for each group.
   - **Student Baseline Knowledge:** Both groups should have a similar baseline level of knowledge on the subject, acquired by the screening of participants.
   - **Study Material:** The content of the study material should be identical so both groups are learning from the same sources.

- **Test Format and Difficulty:** The tests should be of the same format and difficulty to avoid differences in scores due to variations of tests.
- **Instruction Given:** All participants should receive the same instructions.

V. **Procedure:**

Pre-Intervention Setup:

- Gather data on the academic awards of all first-year psychology students of UM Digos College upon their graduation from senior high school.
- Select 40 students who received academic distinction with honor regardless of their gender and age.
- Participants will be randomly assigned into two groups– solo study and peer group study.
- Ensure to prepare identical materials (e.g. textbooks, notes, questionnaire) for both groups.
- The environment will be calm, quiet, and free from destruction. Comfortable seating will be provided.

Experimental Group 1 (Group Study)

1. **Introduction.** The facilitator will briefly instruct the participant about the experiment.
2. **Assignment of group members:** Divide the 20 participants into small groups (4 members each).
3. **Administer the Pretest:** Have everyone (not by group) take an identical set of questions to ensure that they have the same baseline of the topic.
4. **Provide Study Materials:** Distribute identical study materials to each group. Each group will have one copy to make sure that they will be collaborating on the assigned materials and encouraged to discuss with each other.
5. **Set a Time Limit:** Inform participants that they will have a set amount of time (30 minutes) to study the material.
6. **Administer the Posttest:** After the allotted study time, have each participant in the peer study group take the same test from the pretest in the controlled environment.
7. **Collect Test Score:** Gather the result for later comparison with the solo study group.
8. **Debriefing:** After the experiment, participants will be debriefed about the nature of the study, the purpose and the significance of the findings.

Experimental Group 2 (Solo Study)

1. **Introduction.** The facilitator will briefly instruct the participant about the experiment.
2. **Administer the Pretest:** Have each participant take an identical set of questions to ensure that they have the same baseline of the topic.
3. **Provide Study Materials:** Distribute identical study materials to each participant to ensure that they will have their own copy to avoid collaborating and discussion with other participants.
4. **Set a Time Limit:** Inform participants that they will have a set amount of time (30 minutes) to study the material.
5. **Administer the Posttest:** After the allotted study time, have each participant in the peer study group take the same test from the pretest in the controlled environment.
6. **Collect Test Score:** Gather the result for later comparison with the latter.
7. **Debriefing:** After the experiment, participants will be debriefed about the nature of the study, the purpose and the significance of the findings.

VI. **Data Analysis:**

- Input all the collected data into statistical software.

- Perform a t-test to compare the mean quiz scores between the peer study groups and the participants who study individually.
- Analyze the results to determine if there is a significant difference between the two study methods.

VII. **Expected Results:**

- It is hypothesized that social facilitation, specifically study methods (studying with a peer group vs. studying solo) have a significant effect on test performance of students.

VIII. **Ethical Consideration:**

- **Informed Consent:** Participants will be provided with a consent form explaining the purpose of the study, the procedure, and any risks. They will sign the form before participation.
- **Confidentiality:** All data will be kept confidential and anonymous. Identifying information will not be shared.
- **Voluntary Participation:** Participation is voluntary, and participants may withdraw from the study at any time without penalty.
- **Debriefing:** Participants will be debriefed following the study and given a chance to ask questions. Resources for stress management techniques will also be provided.

IX. **Interpretation of Results:**

- Interpret the t-test results, determining whether peer study or solo study had a greater impact on test performance.
- Discuss potential reasons for observed differences, such as peer interaction or focused individual study.

X. **Reporting Findings:**

- Summarize the findings of the study, including statistical significance, effect size, and any relevant insights.
- Discuss the implications for academic study methods and provide recommendations based on the results.

The Impact of Classroom Comfort on Senior High School Students' Academic Performance

Objective: To examine and explore the role of student preferences for specific classroom conditions and how these preferences correlate with their academic success.

1. Hypothesis

- Null Hypothesis (H0): There is no significant relationship between classroom comfort and the academic performance of senior high school students.
- Alternative Hypothesis: There is a significant relationship between classroom comfort and the academic performance of senior high school students.

2. Participants

- Sample Size: The total sample size for this study would be 40 students, with 20 students assigned to each of the two conditions.
- Inclusion Criteria: Healthy students with no current diagnosis or chronic stress
- Exclusion Criteria: Students who are mentally impaired and are diagnosed with mental retardation.

3. Independent Variable:

- Group A (Experimental Group 1) - Group A would consist of students in a high comfort classroom, where factors such as temperature, seating arrangement, lighting, and noise levels are optimized to create a comfortable learning environment.
- Group B (Experimental Group 2) - Group B would consist of students in a low comfort classroom, where factors such as temperature, seating arrangement, lighting, and noise levels are less optimal, creating a less comfortable learning environment.

4. Dependent Variable

- Academic Performance: Measured by and post test scores on an academic assessment directly relevant to the course or subject material studied.
- Post test: Administered after the study session to measure any improvement in understanding.

5. Control Variable

Testing Environment: The experiment will be conducted in a quiet, comfortable room to minimize external distractions.

- Test Duration: Both groups will engage in their respective treatment conditions for the same length of time (30 minutes).
- Time of Day: All participants will be tested at the same day but not on the same time to avoid interference effects and ensure adequate space for each group.
- Study Material: The content of the study material should be identical so both groups are learning from the same sources.
- Test Format and Difficulty: The tests should be of the same format and difficulty to avoid differences in scores due to variations of tests.
- Instruction Given: All participants should receive the same instructions.
- **6. Procedure:**
- *Pre experiment Setup:*

- Select 40 participants from the same program aged 17-20 regardless of their gender.

- Assign 20 students to Group A (high comfort classroom) and 20 students to Group B (low comfort classroom)

- Ensure that all other factors, such as teaching methods, instructional materials, and classroom size, remain constant across both groups.

- *Experimental Group 1 (High Comfort Room)*

- Introduction. The facilitator will briefly instruct the participant about the experiment.

- Assignment of group members: Divide the 20 participants into small groups (4 members each). Ensure that the group size is similar to prevent any group from gaining an advantage due to size.

- Briefing: Brief the students on the study's goals and procedures,ensuring they understand the expectations. Inform them that they will be exposed to a comfortable classroom setting to aid focus and productivity.

- Provide Study Materials: Distribute identical study materials to each group. Each group will have one copy to make sure that they will be collaborating on the assigned materials and encouraged to discuss with each other

- Set a Time Limit: Inform participants that they will have a set amount of time (30 minutes) to study the material.
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- Administer the Posttest: After the allotted study time, have each participant in the peer study group take the same test from the pretest in the controlled environment.
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- Collect Test Score: Gather the result for later comparison with the solo study group.
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- Debriefing: After the experiment, participants will be debriefed about the nature of the study, the purpose and the significance of the findings.

- **Materials Needed:**

- Standardized study material (e.g., PowerPoint Presentation, Printed Pointers)
- Instructions for the pretest, study sessions, and posttest
- Post Test
- Timer or stopwatch
- Data collection sheets for the recording quiz scores
- Statistical software for data analysis (e.g., SPSS®)

- **7. Data Analysis**

- Input all the collected data into a statistical software.

- Use an independent t-test to compare post-test scores between Group A (high comfort) and Group B (low comfort).

- Analyze the results to determine if there is a significant difference between the two study methods.

- **8. Expected Result**

- The expected result is that Group A (high comfort classroom) will demonstrate significantly better academic performance than Group B (low comfort classroom), with statistical analysis showing a significant p-value and a medium to large effect size, indicating that classroom comfort positively influences student performance.

- **Ethical Consideration:**

- Informed Consent: All participants will be fully informed about the purpose of the study, procedures, and potential risks. Written consent will be obtained from students and their parents/guardians.

- Confidentiality: Participant identities and academic performance data will be kept confidential. All data will be anonymized to ensure privacy.

- Right to Withdraw: Participants will be informed that they can withdraw from the study at any time without penalty.

- Fair Treatment: Both groups will receive equal attention and support during the study, with no favoritism or bias in how the classroom conditions are managed.

- Minimizing Harm: Efforts will be made to ensure that the classroom conditions do not cause discomfort or stress, and the academic assessments will not be overly burdensome.

A Study on Cognitive Engagement and Recall

An Experiment on the Impact of Silent Reading vs. Reading Aloud on Student's Comprehension

Objective: To determine how silent reading versus reading aloud affects comprehension levels in students, by measuring their ability to understand, retain, and recall information after engaging with text through each reading method.

1. **Hypothesis:**
    - Null Hypothesis (HO): There is no significant difference in comprehension levels between students who read silently and those who read aloud.
    - Alternative Hypothesis (H1): There is a significant difference in comprehension levels between students who read silently and those who read aloud.
2. **Participants:**
    a. Sample Size: 40 college students (mixed gender) enrolled in the same subject, aged 17-20
    b. Inclusion Criteria: Healthy students with no existing and pre-existing diagnosis of mental retardation conditions.
    c. Exclusion Criteria: Students who are mentally impaired and are diagnosed with mental retardation.

3. Independent Variable:

- Group A (Experimental Group 1): Participants will silently read the passage, facilitated and guided by the experimenter.
- Group B (Experimental Group 2): Participants will read aloud the passage, facilitated and guided by the experimenter.

4. Dependent Variable:

a. Level of Comprehension: Measured by conducting a comprehension quiz and comparing pretest and posttest scores that assess their understanding of key details, main ideas, and inferences. on an academic assessment directly relevant to the subject material studied.
b. Pretest: Administered before the study session to assess baseline knowledge.
c. Posttest: Administered after the study session to measure any improvement in understanding.

5. Control Variables:

a. Testing Environment: The experiment will be conducted in a quiet, comfortable room to minimize external distractions.
b. Test Duration: Both groups will engage in their respective treatment conditions for the same length of time (30 minutes).
c. Time of Day: All participants will be tested at the same day but not on the same time to avoid interference effects and ensure adequate space for each group.
d. Student Baseline Knowledge: Both groups should have a similar baseline level of the knowledge on the subject, which could be controlled by using identical reading material
e. Reading Material: The content of the reading material should be identical so both groups are learning from the same sources.
f. Test Format and Difficulty: The tests should be of the same format and difficulty to avoid differences in scores due to variations of tests.

g. Instruction Given: All participants should receive the same instructions.

6. Procedure:

Pre-Intervention Setup:

- Select 40 participants from the same program aged 17-20 regardless of their gender.
- Participants will be randomly assigned into two groups– reading silently and reading aloud.
- Ensure to prepare identical materials(e.g. textbooks, notes, questionnaire) for both groups.
- The environment will be calm, quiet, and free from destruction. Comfortable seating will be provided.

Experimental Group 1 (Silent Reading)

1. Introduction: Instruct students to read the passage silently and focus on understanding it.
2. Administer the Pretest: Have each participant take an identical set of questions to ensure that they have the same baseline of the topic.
3. Provide Study Materials: Distribute identical reading materials to all participants.
4. Set a Time Limit: Inform participants that they will have a set amount of time (20) to read the passage.
5. Administer the Posttest: After the allotted reading time, have each participant take the same test from the pretest in the controlled environment.
6. Collect Test Score: Gather the result for later comparison with the reading aloud group.
7. Debriefing: After the experiment, participants will be debriefed about the nature of the study, the purpose and the significance of the findings.

Experimental Group 2 (Loud Reading)

1. Introduction: Instruct students to read the passage loudly and focus on understanding it.
2. Administer the Pretest: Have each participant take an identical set of questions to ensure that they have the same baseline of the topic.
3. Provide Study Materials: Distribute identical reading materials to all participants.
4. Set a Time Limit: Inform participants that they will have a set amount of time (20) to read the passage.
5. Administer the Posttest: After the allotted reading time, have each participant take the same test from the pretest in the controlled environment.
6. Collect Test Score: Gather the result for later comparison with the reading aloud group.

7. Data Analysis:

- Input all the collected data into a statistical software.
- Perform a t-test to compare the mean quiz scores between the silent reading group and the load reading group.
- Analyze the results to determine if there is a significant difference between the two study methods.

8. Expected Results:

It is hypothesized that cognitive engagement (silent reading vs. reading aloud) have a significant effect in enhancing learning outcomes and overall academic success of the students.

9. Ethical Consideration:

a. Informed Consent: Participants will be provided with a consent form explaining the purpose of the study, the procedure, and any risks. They will sign the form before participation.
b. Confidentiality: All data will be kept confidential and anonymous. Identifying information will not be shared.
c. Voluntary Participation: Participation is voluntary, and participants may withdraw from the study at any time without penalty.
d. Debriefing: Participants will be debriefed following the study, and given a chance to ask questions. Resources for stress management.

APPENDIX B: Questionnaires and Validations from the Expert Validators

Adapted from Durin (2019) & Dela Peña (2016).

PRETEST - PHILIPPINE HISTORY QUIZ— 30 ITEMS

1.What is the approximate number of islands that comprise the Philippines?

a. 7,541
b. 7,641
c. 7,500
d. 7,841

2. When did the Philippines become independent?

a. July 4,1776
b. July 4, 1946
c. August 14,1947
d. January 1, 1984

3. Which country had the Philippines as its colony from 1898 to 1946, except for some years during World War II?

a. Portugal
b. USA
c. UK
d. Belgium

4. Which country occupied the Philippines during World War II?

a. Germany
b. China
c. Italy
d. Japan

5.What is the term of the President of the Philippines?

a. Four (4) years
b. Five (5) years
c. Six (6) years
d. Seven(7) years

6.Which country had the Philippines as its colony for more than 300 years?

a. Spain
b. Italy
c. France
d. England

7.Who of the following explorers arrived in the Philippines in 1521?

a. Christopher Columbus
b. Ferdinand Magellan
c. Vasco da Gama
d. James Cook

8.Which is the predominant religion of the Philippines?

a. Christianity

b. Islam
c. Buddhism
d. Judaism

9. Which of the following languages is indigenous to the Philippines?
a. Basque
b. Catalan
c. Galician
d. Tagalog

10. Which of the following groups has the Philippines as its member?
a. NATO
b. ASEAN
c. SAARC
d. OAU

11. During a classroom lesson, the Social Studies teacher asked why, despite more than 300 years of Spanish rule, the majority of Filipinos could not speak Spanish. What could be a possible reason for this?
a. Spanish, as an official language, was opposed by Filipinos.
b. The Filipinos in general were not interested in learning Spanish.
c. Spain outlawed the teaching and learning of Spanish by Filipinos.
d. The Spaniards did not propagate the Spanish language.

12. During much of the Spanish occupation, how were the natives of the Philippines called?
a. principalia
b. indios
c. insulares
d. peninsulares

13. Rizal focused the “La Liga Filipina” to:
I. Unite the whole country.
II. Revolt against the Spaniards.
III. Fight violence and injustices.
a. II only
b. I and II only
c. II and III only
d. I and III only

14. The Filipino students are taught to emulate the young Jose Rizal, who was everything listed below, except _____.
a. motivated
b. loner
c. very observant
d. reflective

15. What was Rizal’s greatest resentment during his student days that motivated him to work harder?
a. unequal treatment of students by the Jesuits
b. use of Spanish as a medium of instruction
c. passivity of Filipino students
d. prevailing discrimination

16. Which work of Rizal was said to be an angry man's personal debate on whether or not a violent revolution would solve the Philippine crisis during the Spanish times?

a. Junto al Pasig
b. Noli Me Tangere
c. A la Juventud Filipina
d. El Filibusterismo

17. Who was known as the Lakambini of the Katipunan?

a. Trinidad Rizal
b. Melchora Aquino
c. Gregoria de Jesus
d. Delfina Herbosa

18. Which of the following occurred first?

a. Cry of Balintawak
b. execution of Rizal at Bagumbayan
c. trial and execution of Bonifacio
d. proclamation of Philippine Independence at Cavite

19. Where did Rizal and Bonifacio not agree?

a. in the inclusion of women in the Katipunan
b. in how to win independence from Spain
c. in the manner of organizing the Katipunan
d. in their religious conviction.

20. Who was the "boy general" that tried to delay American advances by making a last stand at Pasong Tirad?

a. Antonio Luna
b. Juan Luna
c. Gregorio del Pilar
d. Macario Sakay

21. For which are the Filipinos thankful for Julian Felipe?

a. the tune of the National Anthem
b. the making of the national flag
c. the lyrics of the National Anthem
d. the draft of the Malolos Constitution

22. Who was the great Filipino reformist known for his work, Fray Botod, which exposed the ignorance, abuses, and immorality of a certain friar?

a. Apolinario Mabini
b. Emilio Jacinto
c. Graciano Lopez-Jaena
d. Jea Alilaya

23. Who was known for the parody of "Our Father"and the "Ten Commandments" in his attempt to campaign against the abuses of the friars?

a. Antonio Luna

b. Pedro Paterno
c. Graciano Lopez-Jaena
d. Marcelo H. del Pil

24. What replaced the tribute as a form of taxation in the Hispanic Philippine colony in 1884?
a. Donativo
b. Santorum
c. Diezmos prediales
d. Cedula personal

25. How did the Hispanic conquest affect the physical features of the conquered native Filipinos, especially in lowland regions?
a. Indian mestizos
b. slit-eyed Chinitos
c. light-skinned, high-nosed mestizos
d. Fil-Am half-breeds

26. In whose painting/s was slavery in the Philippines during the Spanish period clearly depicted?
a. Antonio Luna
b. Felix Hidalgo
c. Juan Luna
d. Jose Rizal

27. Which religious institution is the only living remnant of the Philippine Revolution of 1896 today?
a. Unitarian Church of the Philippines
b. Roman Catholic Church
c. Philippine Independent Church
d. United Church of the Philippines

28. Who was the second editor of La Solidaridad with the pen name Dolores Manapat?
a. Graciano Lopez-Jaena
b. Jose Rizal
c. Marcelo H. del Pilar
d. Mariano Ponce

29. How many ships arrived in the Philippines from Mexico during the Galleon Trade?
a. two
b. three
c. one
d. five

30. What is non-debatable evidence left by Rizal proving his faith in God despite being estranged from his religion?
a. El Filibusterismo
b. Mi Ultimo Adios
c. retraction paper
d. Noli Me Tangere

POSTTEST - PHILIPPINE HISTORY QUIZ — 30 ITEMS

1. During much of the Spanish occupation, how were the natives of the Philippines called?
   a. peninsulares
   b. insulares
   c. indios
   d. principalia

2. Who was the great Filipino reformist known for his work, *Fray Botod*, which exposed the ignorance, abuses, and immorality of a certain friar?
   a. Emilio Jacinto
   b. Apolinario Mabini
   c. Jea Alilaya
   d. Graciano Lopez-Jaena

3. Which country occupied the Philippines during World War II?
   a. Germany
   b. Japan
   c. Italy
   d. China

4. What replaced the tribute as a form of taxation in the Hispanic Philippine colony in 1884?
   a. Diezmos prediales
   b. Cedula personal
   c. Donativo
   d. Santorum

5. Which of the following languages is indigenous to the Philippines?
   a. Tagalog
   b. Catalan
   c. Basque
   d. Galician

6. When did the Philippines become independent?
   a. January 1, 1984
   b. August 14, 1947
   c. July 4, 1946
   d. July 4, 1776

7. What is non-debatable evidence left by Rizal proving his faith in God despite being estranged from his religion?
   a. Mi Ultimo Adios
   b. Noli Me Tangere
   c. retraction paper
   d. El Filibusterismo

8. How did the Hispanic conquest affect the physical features of the conquered native Filipinos, especially in lowland regions?
   a. Indian mestizos

b. light-skinned, high-nosed mestizos
c. Fil-Am half-breeds
d. slit-eyed Chinitos

9. What is the term of the President of the Philippines?
   a. Six (6) years
   b. Five (5) years
   c. Seven (7) years
   d. Four (4) years

10. For which are the Filipinos thankful for Julian Felipe?
    a. the lyrics of the National Anthem
    b. the tune of the National Anthem
    c. the making of the national flag
    d. the draft of the Malolos Constitution

11. During a classroom lesson, the Social Studies teacher asked why, despite more than 300 years of Spanish rule, the majority of Filipinos could not speak Spanish. What could be a possible reason for this?
    a. The Spaniards did not propagate the Spanish language.
    b. Spain outlawed the teaching and learning of Spanish by Filipinos.
    c. Spanish, as an official language, was opposed by Filipinos.
    d. The Filipinos in general were not interested in learning Spanish.

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    d. Gregorio del Pilar

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    b. USA
    c. Belgium
    d. Portugal

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    c. Judaism

d. Buddhism

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    a. I and III only
    b. I and II only
    c. II only
    d. II and III only

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    b. Marcelo H. del Pilar
    c. Antonio Luna
    d. Pedro Paterno

27. Who was the Filipino student that young learners are taught to emulate but was not a loner?
    a. motivated
    b. loner
    c. reflective
    d. very observant

28. What is the approximate number of islands that comprise the Philippines?
    a. 7,500
    b. 7,641
    c. 7,541
    d. 7,841

29. Where did Rizal and Bonifacio not agree?
    a. in the manner of organizing the Katipunan
    b. in the inclusion of women in the Katipunan
    c. in how to win independence from Spain
    d. in their religious conviction

30. Which religious institution is the only living remnant of the Philippine Revolution of 1896 today?
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    c. United Church of the Philippines
    d. Unitarian Church of the Philippines