International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Effectiveness of Ethnomathematics Integration in the Grade 8 of Oanari National High School

Jinkee Mae N. Leal

Teacher III, Department of Education, DepEd – La Union

Abstract

This study determined the effectiveness of ethnomathematics integration in the Grade 8 of Oanari National High School during the SY 2023-2024. Specifically, it sought to know the level, difference, and relationship between the performance, and study habits and attitudes of the students before and after the integration of ethnomathematics. The research used quasi-experimental design and correlational method and assigned 56 student respondents, section Baltazar with 28 students as the control group and section Del Pilar with an equal number of students as the experimental group or the group where ethnomathematics was integrated. A teacher-made test was administered to determine students' level of performance while an adopted questionnaire was utilized to determine the level of study habits and attitude before and after the lesson. Frequency count, percentage, mean, t-test for independent samples, and Pearson r through the Statistical Package for Social Sciences (SPSS) were the statistical tools used. It was found that 1.) the level of performance of the students in the control and experimental groups were both fairly satisfactory on average before the lesson; 2.) the level of performance of the control group remained fairly satisfactory while the experimental group garnered a very satisfactory performance after the integration of ethnomathematics; 3.) students in the control and experimental group both practice the study habits and attitudes relating to reading and note taking, concentration, distribution of time and social relationships, and preparing and taking examinations frequently before and after the lesson; 4.) there was a significant difference between the study habits and attitudes of the students in the control and experimental group before and after the lesson; 5.) there was no significant difference between the level of performance of the control and experimental groups before the lesson, however, a significant difference was found after the lesson; and 6.) there was no significant relationship between the level of performance and study habits and attitudes of the control and experimental group before and after the lesson.

The following are the conclusions based on the result; 1.) grade 8 students generally perform fairly satisfactorily in the pretest. In the post-test, however, students' performance may vary because of varied teaching strategies implored in class; 2.) the grade 8 students frequently practice study habits and attitudes related to reading and note-taking, concentration, distribution of time and social relationships, and preparing and taking examinations; 3.) integration of ethnomathematics positively affects students' study habits and attitudes related to reading and note-taking, concentration, distribution of time and social relationships, and preparing and taking examinations; 4.) integration of ethnomathematics also enhances students' level of performance in Mathematics; 5.) students' level of performance in Mathematics and study habits and attitudes along with reading and note-taking, concentration, distribution of time and social relationships, and preparing and taking examinations have no significant relationship; and 6. the developed enhancement program is very timely and appropriate.

Based on the findings and conclusion drawn, the following recommendations are proposed; 1.) teachers must constantly conduct pre and post-assessment to determine whether or if the implored teaching technique or intervention has a good impact on students' performance. By doing this, the teacher might modify her methods of instruction to better meet the needs of her students; 2.) ethnomathematics should be integrated into teaching mathematics as it was proven to create a positive effect both in students' study habits and attitudes, and academic performance; 3.) teachers should regularly assess students' study habits and attitudes to help them adopt healthier habits and alter negative attitudes that might impair their performances; 4.) future researchers venturing on the same topics are encouraged to include other variables like social status and teacher factor as correlates to be measured; and 5.) the training design should be submitted to the proper DepEd authorities especially to the researcher's school head for approval and when found meritorious, recommend such for use in the district or even in a larger area.

Keywords: ethnomathematics, level of performance, level of study habits and attitudes

Introduction

Mathematics, the science of structure, order, and relation has evolved from elemental practices of counting, measuring, and describing the shapes of objects. It deals with logical reasoning and quantitative calculation, and its development has involved an increasing degree of idealization and abstraction of its subject matter. Since the 17th century, mathematics has been an indispensable adjunct to the physical sciences and technology, and in more recent times, it has assumed a similar role in the quantitative aspects of the life sciences. In many cultures under the stimulus of the needs of practical pursuits, such as commerce and agriculture, mathematics has developed far beyond basic counting. This growth has been greatest in society's complex enough to sustain these activities and to provide leisure for contemplation and the opportunity to build on the achievements of earlier mathematicians (Fraser et al., 2024).

Learning mathematics is essential but learning it is challenging. This is very evident from the performances of learners in mathematics all over the world. According to Vinderine (2023) although the USA is a prominent country, sadly its performance in Mathematics is not as prominent as one might expect. Led by Singapore, five East Asian countries also including Chinese Taipei, Korea, Japan, and Hong Kong SAR, continue to outperform all TIMSS countries, including the USA, in Mathematics by a substantial margin at the fourth and eighth grades (TIMSS, 2020).

As for the Philippines, the TIMSS 2019 shows that Filipinos scored 'significantly lower' than any other country that participated in Grade 4 Mathematics and Science assessments. The Philippines only scored 297 in Mathematics and 249 in Science, which are "significantly lower" than any other participating country (Magsambol, 2020).

The same findings were drawn based on the Philippines' performance on the Program for International Student Assessment (PISA) 2020. According to Chi (2023), students in the Philippines remain among the World's weakest in Mathematics, new findings by the PISA showed, with recent test scores showing no significant improvement from the country's performance in 2018.

Despite the education department's firestorm of reforms and preparations following a dismal showing in PISA 2018, just less than a quarter of Filipino students who took the test in 2022 reached the minimum level of proficiency in Mathematics. Similar to 2018, the latest PISA scores show the Philippines performed worse than the global average in all categories, with its placement in the country rankings

moving up by just a few spots above countries that dropped ranks (Chi, 2023). Furthermore, local assessments also reflect the same conclusion. The performance of Filipino students in large scale assessment - which is the National Achievement Test (NAT) - gravitates towards the low proficiency levels especially in Math (Hernando-Malipot, 2019).

Philippines' Mathematics performance has become more alarming following the devastating effect of the COVID-19 pandemic. The pandemic has caused the largest and the worst disruption to the education creating a significant decline in Mathematics skills of Filipinos. In response, teachers should take part in mitigating this problem by becoming more innovative in teaching and discovering effective teaching technique that could be used in teaching Mathematics.

One teaching pedagogy that Mathematics teachers could utilize is ethnomathematics. Ethnomathematics pedagogy infuses real-life cultural knowledge students bring into the classroom with mathematics curriculum. Cognitive mathematics and academic achievement affirm ethnomathematics as an effective way for students to learn mathematics. Utilizing an ethnomathematics instructional philosophy includes recognizing and honoring students' cultural experiences, creating an effective classroom environment, implementing specific mathematics teaching and learning principles, establishing cultural classroom experiences, understanding concrete real-world ethnomathematics approaches, grasping metacognition, employing math groups, differentiating instruction, assessing what is valued, and implementing curriculum. Furthermore, how to support teachers in their move to ethnomathematics curriculum is expounded (Harding, 2021).

Brazilian mathematician Ubiratan D'Ambrosio coined the term "ethnomathematics" in 1987. This term is used to express the relationship between culture and mathematics. The term requires a dynamic interpretation because it describes concepts that are themselves neither rigid nor singular-namely, ethno and mathematics (D'Ambrosio, 1987).

Ethnomathematics is the intersection where mathematics and culture meet. It is a teaching philosophy that directs and guides mathematics learning practices within the classroom. Ethnomathematics benefits the classroom by improving student mathematics knowledge through focused conversations, productive mathematics struggles, guided inquiry, esteeming cultural knowledge, and dispositions of engagement and motivation. Ethnomathematics is worth the time, effort, and thought because it perpetuates mathematics learning within the classroom (Harding, 2021).

Recent studies in ethnomathematics suggest that ethnomathematics support student agency, achievement, and creativity. Mursalin and Supriadi (2019) explored Sundanese fifth graders' ability to develop creative mathematical designs. The findings report that the fifth graders were able to create dynamic creative mathematical designs that support the children's understanding of various algebra and geometry topics.

In Indonesia, a study conducted by Imswatama and Lukman in 2018 which aimed to measure the effectiveness of mathematics teaching material used based on ethnomathematics toward students' mathematical problem-solving skill and critical thinking found that mathematics teaching material based on ethnomathematics is effective towards improving the students' problem solving skill and critical thinking.

Likewise, Prahmana and Istiandaru (2021) examined the use of the Indonesia Javanese shadow puppet to explore the mathematical topic of set theory. The findings suggest that the Indonesia Javanese shadow puppet was used to convey many concepts of set theory, such as "definition of sets, universal sets,

subsets, union of the set, intersection of the set, complement of the set, empty set". However, more research exploring ethnomathematics is desired.

Various indigenous peoples' education initiatives in the Philippines, including recent efforts of the Department of Education, bring to light the continuing need to develop mathematics lessons that are culturally relevant for indigenous Filipino students. In general, teachers involved in Indigenous peoples' education have difficulty in developing culturally relevant Mathematics lessons, with the relative exception of PAMANA KA, a school for indigenous Mangyan in San Jose, Mindoro (Alangui, 2017).

Alangui's (2017) current involvement with this school as well as with the Gohang National High School in Banaue, Ifugao, shows how a modified framework for an ethnomathematical curriculum model admits a wider possibility for mathematical thinking and investigation based on cultural practice. Ethnomathematics may be a useful theoretical framework for the pursuit of culturally relevant mathematics education in the Philippines.

The researcher was motivated to investigate the integration of ethnomathematics in Grade 8 at Oanari National High School by these pertinent facts and conclusions. From the creation of lesson plans, instructional materials, and self-learning modules to the actual teaching of lessons in the classroom, the integration of ethnomathematics in the aforementioned institution is already apparent. The area where this school is located is culturally rich, yet industrialization and technology have taken over and make it difficult to preserve. An ethnic group's culture and values define its identity, hence efforts should be taken to protect them. Ethnic related knowledge is first assimilated at home but the school should take part in integrating this not only in Mathematics but in all areas.

The study attempted to discover the effect of ethnomathematics integration in the Grade 8 of Oanari National High School to the level of performance, study-habit, and attitudes of the students. Aside from this, it sought to find out the relationship between learners' performance in mathematics and the study-habits and attitudes of the group of learners where ethnomathematics was integrated and the group where ethnomathematics was not integrated which led to the formulation of the educational implications of ethnomathematics in the teaching-learning process, and mathematics curriculum enrichment.

Literature Review

The researcher reviewed various literature which have bearing on this study. The reviewed studies will be extensively used to substantiate the findings and the results of the study.

Level of Learners' Performance using Ethnomathematics

Past studies revealed that the integration of ethnomathematics approaches is of great importance in the teaching and learning of mathematics as it is believed to improve learners' understanding and achievement in mathematics. Cognisant of the benefits of using ethnomathematics approaches in teaching and learning mathematics, the Zimbabwean school syllabus recommends the adoption and integration of ethnomathematics approaches to improve the learners' performance (Sunzuma, et. al. (2021).

The purpose of the mixed-method study conducted by Sunzuma et al. (2021) was to determine the comparative effectiveness of ethnomathematics approaches and the traditional lecture approaches as well as teachers' views on the use of ethnomathematics approaches. The study sample comprised 90 learners and two teachers from one secondary school in Bindura district in Zimbabwe. Two instruments,

a test and interviews were used for data collection. The participating teachers taught the concepts of consumer arithmetic for four weeks.

Findings of the study showed that learners taught using an ethnomathematics approach achieved significantly higher in the test than those taught consumer arithmetic using the traditional approach. The study revealed that teachers appreciated the use of ethnomathematics approaches in the teaching of consumer arithmetic as their learners were motivated, actively involved and interested in learning the concepts. It was also reported that ethnomathematics approaches improve learners' understanding and retention of arithmetic concepts. The study, therefore, recommended training of the teachers on the use of the ethnomathematics approach in the teaching and learning of consumer arithmetic (Sunzuma, et. al., 2021).

Level of Study Habits and Attitudes

Study habits are buying out dedicated schedules and un-interrupted time to apply one's self to learning. Without it, one does grow and become self-limiting in life. Study habits contribute significantly in the development of knowledge and perceptual capacities. Study habits tell a person that how much he will learn and how far he wants to go, and how much he wants to earn. These all could be decided with the help of one's study habits, throughout the life. Rabia, et.al (2017), states that the researchers have analyzed the pupil's achievement with reference to the classification high, average, and low achievers, in this conventional classification, the point of reference in the average score group or a standard norm, but study habits differ from person to person, hence in an attempt to help the learners progress by developing suitable study habits, we need a different set of parameters that takes into account of the individual capabilities.

Study habits is a well-planned and deliberate pattern of study which has attained a form of consistency on the part of the learners towards understanding academic and passing at examination. Good study habits and academic achievement walk hand in hand. She added that if you want to achieve success in any academic level you need to learn how to study more effectively. The majority of learners get mediocre to okay grades only because they get bored and do not do the right things at school. School can be fun and more effective to anyone that follows good study habits to get better grades (Mapa, 2014).

Mapa (2014) states that good study habits help the learners in critical reflection is kills outcomes such as selecting, analyzing, critiquing, and synthesizing. Likewise, he states that study habits are learning tendencies that enable learners work private.

Effective habits of study include plan/place, a definite time table and taking brief of well-organized notes. Good study habits are "good asset to learners because they (habits) assist learners to attain mastery in areas of specialization and consequent excellent performance, while the opposite constitute constraints to learning and performance leading to failure." The main purpose of instruction is to enable learners to learn, whereas the teacher's task is to facilitate the learning process and help learners develop study habits and right attitude towards learning.

It is important that learners be provided with opportunities to see direct relationship between their mathematical studies and real-life situations they encounter, to solve a range of unfamiliar problems in inventive and creative ways, and to develop a deep understanding of the Mathematics involved. Learners also need to develop positive attitudes towards Mathematics and towards their own involvement in doing Mathematics. When learners have opportunities to think, reason, and work mathematically, they develop

confidence in their abilities to reason, select strategies, apply knowledge, and justify their thinking. (https://www.waikato.ac.nz/wmier/projects/strenghtening/mathematical-thinking-and-reasoning)

Relationship between Learners' Study-habits and Attitudes toward Mathematics and their Performance

The relationship between learners' attitudes toward mathematics and mathematics achievement has garnered tremendous attention from researchers. However, there is a degree of inconsistency in the findings regarding this relationship. Therefore, Sunghwan Hwang and Teakwon Son (2021) conducted a study that aimed to identify the profiles of learners' attitudes toward mathematics and examine their relationship with mathematics achievement. Using latent profile analysis, they examined data from the Trends in International Mathematics and Science Study conducted in Singapore in 2019.

They identified four profiles of attitudes toward mathematics, namely very negative (5.44%), negative (41.38%), neutral (38.77%), and positive (14.41%). They also confirmed the literature describing learners' attitude toward mathematics as a multidimensional integrated construct, comprising 'like mathematics,' 'value mathematics,' and 'confidence in mathematics.' Moreover, they discovered a positive relationship between learners' attitudes toward mathematics and mathematics achievement (Hwang & Son, 2021).

These results showed that the following learners are more likely to have high mathematics achievement: (a) those who like to study mathematics and pursue mathematics-related activities, (b) those who believe that learning mathematics will result in a positive outcome (e.g., success in school and job opportunities), and (c) those who trust in their mathematical abilities. Therefore, educators need to examine learners' attitudes toward mathematics and provide appropriate support to stimulate the development of a positive attitude toward mathematics (Hwang & Son, 2021).

Another study by Capuno et. al. in 2019 delved into the attitudes, study habits, and academic performance if junior high school learners in mathematics. This study was conducted in a public national high school in the Mandaue City Division, Cebu, Philippines. The respondents were the 177 Grade 9 learners enrolled in mathematics. These respondents were selected using probability random sampling. They were asked to answer a standardized survey questionnaire to assess their attitudes and study habits. The tool is consists of three parts. Part 1 gathers the socio-demographic profile of the respondents. Part 2 assesses the attitudes of the respondents towards mathematics, while Part 3 was used to assess the study habits of the respondents. Furthermore, their academic performance in mathematics was measured based on their first quarter grade, which was retrieved from the Registrar's Office (Capuno, et al (2019).

The study revealed that those respondents had positive attitudes towards mathematics in terms of its value while they had a neutral attitude when it comes to their self-confidence, enjoyment, and motivation in mathematics. Also, the study shows that there was a negligible positive correlation between the attitudes and academic performance of the respondents in terms of their self-confidence, enjoyment, and motivation while there was a weak positive correlation between the value of mathematics and their academic performance in math. It was concluded that students' attitudes and their study habits are significant factors that affect their performance in mathematics. The researchers strongly recommend the utilization of the enhancement plan in the teaching of mathematics to junior high school students.

Ethnomathematics' Educational Implications in the Teaching-learning Process and Mathematics Curriculum Enrichment

Sunzuma & Maharaj (2020) conducted a study the explored Zimbabwean mathematics teachers' integration of ethnomathematics approaches into the teaching and learning of geometry. The study used a convergent parallel mixed-methods design, which combined both quantitative and qualitative methods, to provide a deeper understanding of how the participants integrate ethnomathematics approaches into the teaching and learning of geometry.

The data for the study were gathered from 40 in-service mathematics teachers through the use of questionnaires and focus group discussions. Results showed that the in-service teachers integrate ethnomathematics approaches into the teaching and learning of geometry as learning materials, resources, and the learning context. Based on the study, it is suggested that teachers should consider the incorporation of ethnomathematics approaches into the teaching and learning of geometry using technological means such as the internet, TV, and films. The findings have implications for continuous teacher professional development in the forms of workshops for the teachers involving the use of ethnomathematics approaches (Sunzuma & Maharaj, 2020).

METHODS

Descriptive design was employed in this study since it described the performance, study habits, attitudes of students, educational implications of ethnomathematics in the teaching-learning process and mathematics curriculum enrichment. According to McCombes (2019), descriptive research aims to systematically describe a population, situation, or phenomenon.

Quasi-experimental design was also employed in this study. This design is a research method that seeks to evaluate the causal relationships between variables, but without the full control over the independent variable(s) that is available in a true experimental design (Hassan, 2023). In this study, ethnomathematics was integrated in one group of respondents while the group did not receive any treatment. Comparison of the two groups' performance and study-habit and attitudes led to the formation of educational implications of ethnomathematics integration in the teaching-learning process and mathematics curriculum enrichment.

Moreover, correlational method was utilized to know the relationship between the performance of the student-respondents in mathematics and their study-habit and attitudes towards the subject before and after the intervention. A correlational research design measures a relationship between two variables without the researcher controlling either of them. It aims to find out whether there is either a positive correlation, negative correlation, or zero correlation (McCombes, 2020).

RESULTS AND DISCUSSIONS

The following are the findings of this study:

Level of Performance of the Experimental Group before the Intervention

The level of performance of the experimental group, or the group of Grade 8 students to whom ethnomathematics was integrated, prior to intervention is displayed in Table 1.1.

Table 1.1. Level of Performance of the Experimental Group before the Intervention

Range of Scores	Frequency (f)	Percentage (%)	Descriptive Equivalent Rating
41 – 50	0	0	Outstanding

31 – 40	0	0	Very Satisfactory
21 – 30	3	10.71	Satisfactory
11 – 20	23	82.14	Fairly Satisfactory
0 – 10	2	7.14	Did not meet the expectation
Total	28	100%	Mean: 15.79 DER: Fairly Satisfactory

The data in the table shows that the experimental group's mean score on the 50-item pretest was 15.79, which is deemed to be fairly satisfactory. Of the 28 pupils, 23, or 82.14% attained a score in the 11–20-point range which is considered to be fairly satisfactory. Out of the remaining 5 students, 3 or 10.71% of the group performed satisfactorily and 2 or 7.14% did not meet the expectation. Furthermore, none of the students got a score higher than 30 which implies that the students had limited or low pre-existing knowledge about the lesson before the discussion.

Level of Performance of the Experimental Group after the Intervention

Table 1.2 displays the level of performance of the experimental group, or the group of Grade 8 students to whom ethnomathematics was integrated, after the intervention.

Table 1.2. Level of Performance of the Experimental Group after the Intervention

Range of Scores	**Frequency (f)**	**Percentage (%)**	**Descriptive Equivalent Rating**
41 – 50	14	50	Outstanding
31 – 40	11	39.29	Very Satisfactory
21 – 30	1	3.57	Satisfactory
11 – 20	2	7.14	Fairly Satisfactory
0 – 10	0	0	Did not meet the expectation
Total	28	100%	Mean: 39.04 DER: Very Satisfactory

The table shows that the group obtained a very satisfactory mean score of 39.04. Half of the group obtained an outstanding score, a score ranging from 41-50, while 11 students or 39.29% of the group garnered a very satisfactory score. Only a small fraction of students scored 21 to 30 (3.57%) and 11 to 20 (7.14%), with no students scoring zero to 10.

The mean score of 39.04, which falls within the "Very Satisfactory" range, suggests that the integration of ethnomathematics had a positive impact on the students' performance. The intervention appears to have been effective, as evidenced by the high percentages of students achieving "Outstanding" and "Very Satisfactory" ratings. The absence of students scoring in the "Did not meet the expectation" category indicates that the intervention successfully elevated the lower-performing students' scores.

The result corroborates the study conducted by Vitoria et. al. (2021) about the effect of ethnomathematics teaching materials on students' understanding of Mathematics. It was concluded in their research that the implementation of the ethnomathematics teaching material helps students understand Mathematics which implies that the integration of ethnomathematics is beneficial for mathematics learning. They further claim that ethnomathematics makes mathematics learning easier and more meaningful.

Level of Performance of the Control Group before the Intervention

The level of performance of the control group, the group of Grade 8 students where ethnomathematics was not integrated, is displayed in Table 1.3.

Table 1.3. Level of Performance of the Control Group before the Intervention

Range of Scores	Frequency (f)	Percentage (%)	Descriptive Equivalent Rating
41 – 50	0	0	Outstanding
31 – 40	0	0	Very Satisfactory
21 – 30	1	3.57	Satisfactory
11 – 20	24	85.71	Fairly Satisfactory
0 – 10	3	10.71	Did not meet the expectation
Total	28	100%	Mean: 14.21 DER: Fairly Satisfactory

In the 50-item pretest, no students scored above 30. The majority of students, 85.71% of the 28 students, obtained a score ranging from 11 to 20, categorized as "Fairly Satisfactory." A small percentage (10.71%) scored 0 to 10, described as "Did not meet the expectation," and 3.57% scored 21 to 30, rated as "Satisfactory."

Most students fell within the lower performance bands (11-20), indicating a general struggle with the test. The majority being rated "Fairly Satisfactory" shows students' lack of prior knowledge about the topic covered in the test. Moreover, the mean score of 14.21 supports the observation of overall low performance, reaffirming the need for teaching and intervention.

Level of Performance of the Control Group after the Intervention

Table 1.4 reflects the level of performance of the control group in the 50-item post-assessment administered after the lesson.

Table 1.4. Level of Performance of the Control Group after the Intervention

Range of Scores	Frequency (f)	Percentage (%)	Descriptive Equivalent Rating
41 – 50	0	0	Outstanding
31 – 40	0	0	Very Satisfactory
21 – 30	5	17.86	Satisfactory
11 – 20	21	75	Fairly Satisfactory
0 – 10	2	7.14	Did not meet the expectation
Total	28	100%	Mean: 15.46 DER: Fairly Satisfactory

The data indicates that the majority of students, 75% or 21 students, still scored within the "Fairly Satisfactory" range (11-20). A small increase in the number of students achieving "Satisfactory" scores (21-30) was achieved, from 1 student in the pretest to 5 students in the posttest. No students reached the higher performance bands of "Very Satisfactory" or "Outstanding."

The distribution of scores shows slight improvement, with 17.86% now scoring in the "Satisfactory" range compared to pre-intervention scores. Despite the lectures or discussions made, the predominant rating remains "Fairly Satisfactory," indicating only marginal improvement. The mean score increased

from 14.21 to 15.46, suggesting a slight positive effect of teaching, but not substantial enough to elevate the majority of students into higher performance categories.

Level of Study Habits and Attitudes along with Reading and Note-Taking Technique of the Experimental Group before the Intervention

The level of study habits and attitudes along with reading and note-taking techniques of the experimental group before the integration of ethnomathematics is presented in Table 2.1

Table 2.1. Level of Study Habits and Attitudes along with Reading and Note Taking Technique of the Experimental Group before the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. The words have much meaning for the first time I go over so I re-read materials several times.	3.93	Generally
2. I tend to take down materials that turn out to be unimportant because I have trouble picking out important points from materials read or studied.	3.39	Frequently
3. I go back and recite to myself the materials studied-rechecking any point I found doubtful.	4.21	Almost Always
4. I pronounce the words to myself as I read.	4.36	Almost Always
5. I miss important points in the lecture while I copy down notes on something which has gone before while lectures are going on and so I miss important points there.	3.64	Generally
Grand Mean	**3.91**	**Generally**

Based on the table, the grand mean of the experimental group in reading and note-taking technique of 3.91 described as “Generally” highlights a mix of good practice and areas needing improvement.

The data shows that the mean ratings for the 3rd and 4th indicators are 4.21 and 4.36 which indicates that students almost always review and recite material, show a strong habit of self-assessment, and almost always use verbal reinforcement for better comprehension. The mean of 3.93 and 3.64 for indicators 1 and 2 shows that students generally re-read materials multiple times for better comprehension and generally miss important points during the lecture while writing down notes. The 3rd indicator has the lowest mean of 3.39 which means that students in the experimental group tend to take down materials that turn out to be unimportant attributing troubles picking out important points from materials read or studied.

Indicators 1, 3, and 4, the indicators where the means are high, are indications of positive reading and note-taking techniques, thus implying that the group has good study habits and attitudes in reading and note-taking. Moreover, indicators 2 and 5, which are not good habits in reading and note-taking, received the lowest means, thus showing lower risks of adopting negative habits in the said area.

Level of Study Habits and Attitudes along with Reading and Note Taking Technique of the Experimental Group after the Intervention

Table 2.2 shows the level of study habits and attitudes along with reading and note-taking techniques of the experimental group after the integration of ethnomathematics.

Table 2.2. Level of Study Habits and Attitudes along with Reading and Note-Taking Technique of the Experimental Group after the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. The words have much meaning for the first time I go over so I re-read materials several times.	3.96	Generally
2. I tend to take down materials that turn out to be unimportant because I have trouble picking out important points from materials read or studied.	3.57	Generally
3. I go back and recite to myself the materials studied-rechecking any point I found doubtful.	3.71	Generally
4. I pronounce the words to myself as I read.	3.89	Generally
5. I miss important points in the lecture while I copy down notes on something which has gone before while lectures are going on and so I miss important points there.	3.79	Generally
Grand Mean	**3.78**	**Generally**

The table shows that the 1st indicator has the highest mean (3.96), which conveys that students still generally re-read materials, indicating ongoing comprehension efforts with slight improvement from pre-intervention. The rest of the indicators have a lower mean than the 1st, however, all still fell in the "Generally" descriptive equivalent. The mean of the 2nd indicator increased from 3.39 before the integration of ethnomathematics to 3.57 after, showing that students generally find it more difficult to identify key points. Though the mean slightly decreased, the mean of 3.71 for the 3rd indicator still shows that students' habits of reviewing, reciting, and rechecking points remained strong. The mean of 3.89 in the 4th indicator reflects students' continuous use of verbal reinforcement, reflecting consistent effective reading habits. Lastly, the 3.79 mean of the 5th indicator shows that students still find difficulty in simultaneous listening and writing.

Level of Study Habits and Attitudes along with Reading and Note Taking Techniques of the Control Group before the intervention

The table below displays the level of study habits and attitude along with reading and note-taking techniques of the control group before the integration of ethnomathematics.

Table 2.3 Level of Study Habits and Attitudes along with Reading and Note-Taking Techniques of the Control Group before the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. The words have much meaning for the first time I go over so I re-read materials several times.	**3.93**	**Generally**
2. I tend to take down materials that turn out to be unimportant because I have trouble picking out important points from materials read or studied.	**2.57**	**Sometimes**

3. I go back and recite to myself the materials studied-rechecking any point I found doubtful.	**3.82**	**Generally**
4. I pronounce the words to myself as I read.	**3.57**	**Generally**
5. I miss important points in the lecture while I copy down notes on something which has gone before while lectures are going on and so I miss important points there.	**2.82**	**Frequently**
Grand Mean	**3.34**	**Frequently**

The overall mean of 3.34 suggests that the control group has consistent yet imperfect study habits and attitudes in reading and note-taking before the lesson.

Students generally have a habit of re-reading materials several times, going back, reciting, checking doubtful points, and pronouncing words while reading proven by the high means of indicators 1, 3, and 4. The mean of 2.57 in the 2nd indicator implies that students sometimes struggle to identify key points, leading to ineffective note-taking, while the mean of 2.82 in the last indicator points out that they frequently miss important points during lectures, indicating challenges in simultaneous listening and writing.

Level of Study Habits and Attitudes along with Reading and Note Taking Technique of the Control Group after the Intervention

Table 2.4 presents the level of study habits and attitudes along with reading and note-taking techniques of the control group after the lesson.

Table 2.4. Level of Study Habits and Attitudes along with Reading and Note Taking Technique of the Control Group after the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. The words have much meaning for the first time I go over so I re-read materials several times.	**3.21**	**Frequently**
2. I tend to take down materials that turn out to be unimportant because I have trouble picking out important points from materials read or studied.	**3.36**	**Frequently**
3. I go back and recite to myself the materials studied-rechecking any point I found doubtful.	**3.36**	**Frequently**
4. I pronounce the words to myself as I read.	**4.11**	**Generally**
5. I miss important points in the lecture while I copy down notes on something which has gone before while lectures are going on and so I miss important points there.	**3.50**	**Generally**
Grand Mean	**3.51**	**Generally**

The data reveals that the grand mean of the group for reading and note-taking techniques is 3.51, rated as "generally" showing improvement after the lesson but highlighting areas that still need attention.

The 4th indicator received the highest mean in the post-intervention rating followed by the 5th. The mean of 4.11 in the 4th indicator points to students' general usage of verbal reinforcement while the 3.50 mean of the 5th indicator implies students' general challenge in simultaneous listening and writing. Moreover,

the means of 3.21 for indicators 1 and 3.36 for indicators 2 and 3 signify frequent re-reading materials to amplify comprehension, frequent struggles in identifying key points, and frequent recitation and rechecking of doubtful points.

The control group's reading and note-taking techniques showed some improvement after the lesson, particularly in going back, reciting to self, rechecking doubtful points (indicator 3), and pronouncing words while reading (indicator 4). However, challenges in identifying important points and missing lecture content while taking down notes became more persistent after the lesson suggesting that more targeted strategies may be needed to enhance their habits and attitudes in these areas.

Level of Study Habits and Attitudes along with Habits of Concentration of the Experimental Group before the Intervention

Table 2.5 details the study habits and attitudes explicitly in habits of concentration of the experimental group before the integration of ethnomathematics.

Table 2.5. Level of Study Habits and Attitudes along with Habits of Concentration of the Experimental Group before the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. I find it hard to keep my mind on what I am studying. I do not know what I have been reading about when I get through.	**3.32**	**Frequently**
2. I have a tendency to daydream when trying to study.	**3.57**	**Generally**
3. It takes me some time to get settled and warm up to the task of the study.	**3.79**	**Generally**
4. I have to wait for the mood to strike me, or for "an inspiration" before starting a task so I am likely to waste time.	**3.04**	**Frequently**
Grand Mean	**3.43**	**Generally**

Based on the data, the habits of concentration of the group are rated as "generally" on average, indicating that the issues specified on each indicator are common but not universal among the students.

The biggest problem related to concentration falls in the 3rd indicator whose mean is equal to 3.79 which denotes that students take some time to settle and get engaged, suggesting procrastination or difficulty in initiating study. The 2nd indicator's mean (3.57) is also described as "generally" which reflects students' tendency to daydream while studying, which disrupts their ability to stay on task. The means of the 1st and 4th indicators, 3.32 and 3.04, are lower than that of the 2nd and 3rd, however, these numbers still dictate students' frequent struggle to maintain focus and to wait for a mood or inspiration before starting tasks. Overall, the numbers reveal significant issues in concentration and study habits within the experimental group before the intervention.

Level of Study Habits and Attitudes along with Habits of Concentration of the Experimental Group after the Intervention

Table 2.6 outlines the study habits and attitudes along with concentration levels of the experimental group after the integration of ethnomathematics.

Table 2.6 Level of Study Habits and Attitudes along with Habits of Concentration of the Experimental Group after the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. I find it hard to keep my mind on what I am studying. I do not know what I have been reading about when I get through.	**3.18**	**Frequently**
2. I have a tendency to daydream when trying to study.	**2.86**	**Frequently**
3. It takes me some time to get settled and warm up to the task of the study.	**3.21**	**Frequently**
4. I have to wait for the mood to strike me, or for "an inspiration" before starting a task so I am likely to waste time.	**3.14**	**Frequently**
Grand Mean	**3.10**	**Frequently**

All of the means of the indicators gained a descriptive equivalent of "frequently". Moreover, all of the indicators' mean decreased after the integration of ethnomathematics except for the 4th.

The 1st indicator's mean of 3.18 connotes that students frequently find it hard to focus, showing a slight improvement from pre-intervention (3.32). The 2nd indicator's mean of 2.86 further shows a noticeable improvement to the mean before the integration of ethnomathematics (3.57). This represents the lesser frequency of students' daydreaming during class. The 3rd indicator also decreased from 3.79 to 3.21 suggesting that students needed a shorter time to settle and warm up to the task. However, the 4th indicator's mean increased by a small fraction implying that the problem of waiting for the mood or inspiration before starting to study is still frequent and evident among students after the intervention.

In conclusion, the experimental group experienced modest improvements in the habits of concentration with the integration of ethnomathematics. While the overall rating remains "frequently", indicating ongoing issues, the intervention appears to have had a positive impact on focus, daydreaming, and task initiation.

These data support the claim of Jenni Harding (2021) that ethnomathematics benefits the classroom by improving student's mathematics knowledge as well as their dispositions of engagement and motivation. Ethnomathematics is worth the time, effort, and thought because it perpetuates mathematics learning within the classroom, she further states.

Level of Study Habits and Attitudes along with Habits of Concentration of the Control Group before the Intervention

Table 2.7 illustrates the study habits and attitudes particularly in the concentration levels of the control group before the lesson.

Table 2.7 Level of Study Habits and Attitudes along with Habits of Concentration of the Control Group before the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. I find it hard to keep my mind on what I am studying. I do not know what I have been reading about	**2.96**	**Frequently**

when I get through.		
2. I have a tendency to daydream when trying to study.	**2.93**	**Frequently**
3. It takes me some time to get settled and warm up to the task of the study.	**2.61**	**Frequently**
4. I have to wait for the mood to strike me, or for "an inspiration" before starting a task so I am likely to waste time.	**2.43**	**Sometimes**
Grand Mean	**2.73**	**Frequently**

Students' frequent struggle to keep their minds on what they are studying, suggesting moderate concentration issues, is reflected by the mean of 2.96 for 1st indicator. The 2nd and 3rd means (2.93 and 2.61) also show frequent daydreaming while studying and taking some time to get settled down and start studying, hinting distraction and occasional procrastination as a common issue among students in the control group. On a positive note, the 4th indicator obtained a low mean (2.43), which signifies that difficulty in finding the mood and inspiration to start a task is only experienced sometimes by the students.

Additionally, the grand mean (2.73) is rated as "frequently", showing that the control group often encounters difficulties with focus and motivation, but these issues are not pervasive.

Level of Study Habits and Attitudes along with Habits of Concentration of the Control Group after the Intervention

The level of study habits and attitudes along with habits of concentration of the control group after the intervention is displayed in the table below.

Table 2.8 Level of Study Habits and Attitudes along with Habits of Concentration of the Control Group after the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. I find it hard to keep my mind on what I am studying. I do not know what I have been reading about when I get through.	**3.00**	**Frequently**
2. I have a tendency to daydream when trying to study.	**3.46**	**Generally**
3. It takes me some time to get settled and warm up to the task of the study.	**3.07**	**Frequently**
4. I have to wait for the mood to strike me, or for "an inspiration" before starting a task so I am likely to waste time.	**2.54**	**Sometimes**
Grand Mean	**3.02**	**Frequently**

The data revealed that the group still frequently encountered problems related to the habits of concentration stated by each indicator, as proven by the overall mean of 3.02.

All of the means of the indicators increased after the lesson signaling a bigger problem regarding concentration in the post-intervention than in the pre-intervention period. Of the 4, the 2nd indicator's mean (3.46), described as "generally", is the highest, which infers that students generally tend to

daydream while studying. The 3.00 and 3.07 means of the 1st and 2nd indicators respectively, convey frequent struggles in keeping focus and increased difficulty in initiating study. Moreover, the least habit of concentration-related problems is depicted by the 4th indicator, however, from 2.43, its mean increased to 2.54 after the lesson thus indicating the students still wait for the right mood or inspiration before starting a task sometimes.

A study conducted by Vy Hanh Le (2021) noted that concentration is one of the most influential decisive factors in student's learning quality. It claims that low levels of concentration ability make students find it hard to achieve the best outcomes in their studies. Though the problems relating to the habits of concentration are only frequently encountered by the students in the control group, it is still best to find remedies to mitigate these problems since concentration is influential in learning, as Le asserts.

Level of Study Habits and Attitudes along with Distribution of Time and Social Relationship of the Experimental Group before the Intervention

The level of study habits and attitudes along with the distribution of time and social relationships of the experimental group before the intervention is presented in Table 2.9

Table 2.9 Level of Study Habits and Attitudes along with Distribution of Time and Social Relationship of the Experimental Group before the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. My study period is often too short for me to get "warmed up" and concentrated.	**3.36**	**Frequently**
2. My time is wisely distributed; I manage my time so I have enough time to accomplish all my tasks.	**4.43**	**Almost Always**
3. I find it hard to force myself to finish my work by a certain time, under pressure; work is unfinished; inferior, or on time.	**3.54**	**Generally**
4. I study with others rather than all by myself.	**4.00**	**Generally**
5. My enjoyment of talking/gossiping with my friends / listening to the radio / watching TV interfaces with my study.	**2.93**	**Frequently**
6. I spend too much time on comics, fiction, going on shows, etc., for the good of my school work.	**2.75**	**Frequently**
7. Too much social events like parties, dates, and trips interfere with school success.	**3.07**	**Frequently**
8. Dislike of certain teachers and subjects interferes with my school's success.	**2.82**	**Frequently**
9. Personal, family, and financial problems cause neglect of school work.	**2.29**	**Sometimes**
10. Inaccessibility of study materials interferes with my study.	**3.61**	**Generally**
Grand Mean	**3.28**	**Frequently**

The 1st indicator reveals that students frequently found their study periods too short to get "warmed up" and concentrated, with a mean of 3.36. Despite this, they managed their time wisely, indicated by a me-

an of 4.43, showing that they almost always distribute their time effectively to accomplish tasks.Students generally found it hard to force themselves to finish work under pressure, as reflected in a mean of 3.54 of the 3rd indicator. They also generally preferred studying with others, which is shown by the 4th indicator's mean of 4.00. Though rated low, indicator 4 still infers frequent social distractions, such as talking with friends or listening to the radio, with students' studies, with a mean of 2.93. Excessive time spent on entertainment activities also frequently affected their school work, as indicated by a mean of 2.75 of the 6th indicator.

The mean of 3.07 for the 8th indicator denotes that social events like parties and trips frequently interfered with their academic success. Indicator 8 or dislike for certain teachers and subjects frequently hindered the group's school performance, reflected in a mean of 2.82. However, personal, family, and financial problems (indicator 9) only sometimes caused neglect of schoolwork, as shown by a mean of 2.29. Finally, the mean of 3.61 of the last indicator implies that the inaccessibility of study materials generally interfered with their study efforts.

The grand mean of 3.28 suggests that the experimental group frequently encounters these issues, highlighting significant areas where interventions could improve their study habits and attitudes along the distribution of time and social relationships.

Level of Study Habits and Attitudes along with Distribution of Time and Social Relationship of the Experimental Group after the Intervention

The table below shows the level of study habits and attitudes along with the distribution of time and social relationships of the experimental group after the integration of ethnomathematics.

Table 2.10 Level of Study Habits and Attitudes along with Distribution of Time and Social Relationship of the Experimental Group after the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. My study period is often too short for me to get "warmed up" and concentrated.	**2.50**	**Sometimes**
2. My time is wisely distributed; I manage my time so I have enough time to accomplish all my tasks.	**3.36**	**Frequently**
3. I find it hard to force myself to finish my work by a certain time, under pressure; work is unfinished; inferior, or on time.	**3.18**	**Frequently**
4. I study with others rather than all by myself.	**3.36**	**Frequently**
5. My enjoyment of talking/gossiping with my friends / listening to the radio / watching TV interfaces with my study.	**2.93**	**Frequently**
6. I spend too much time on comics, fiction, going on shows, etc., for the good of my school work.	**2.86**	**Frequently**
7. Too much social events like parties, dates, and trips interfere with school success.	**2.71**	**Frequently**
8. Dislike of certain teachers and subjects interferes with my school's success.	**2.57**	**Sometimes**
9. Personal, family, and financial problems cause	**3.04**	**Frequently**

neglect of school work.		
10. Inaccessibility of study materials interferes with my study.	**2.93**	**Frequently**
Grand Mean	**2.94**	**Frequently**

After the intervention, students reported that their study periods were only sometimes too short to get "warmed up" and concentrated, which is indicated by the 1st indicator's mean of 2.50. Time management was less effective than before, with a mean of 3.36 indicating that they frequently managed their time to accomplish tasks.

The mean of the 3rd and 4th indicators (3.18 and 3.36) suggests that students still frequently struggled to complete work under pressure, and often preferred studying with others. Social distractions, such as talking with friends or listening to the radio, continued to interfere frequently with their studies, shown by a mean of 2.93. Excessive time spent on entertainment activities remained a frequent issue, obtaining a mean of 2.86.

Social events like parties and trips still frequently interfered with academic success, implied by the mean of 2.71 on the 7th indicator. The 8th indicator gained a lower mean of 2.57 compared to the pre-intervention period which indicates that dislike for certain teachers and subjects interfered with school success only sometimes. Personal, family, and financial problems causing neglect of schoolwork (indicator 9) and inaccessibility of study materials (indicator 10) remained frequent issues, proven by the computed means of 3.04 and 2.93 respectively.

The grand mean of 2.94 suggests that the experimental group frequently encounters issues related to time management and social distractions. However, the intervention appears to have reduced some problems, such as finding study periods too short to get warmed up and concentrated (indicator 1), finding it hard to finish tasks by a certain time or when under pressure (indicator 3), interference with school success because of social events (indicator 7), dislike for certain teachers and subjects (indicator 8), and interference of study due to inaccessibility of study materials.

Level of Study Habits and Attitudes along with Distribution of Time and Social Relationship of the Control Group before the Intervention

Table 2.11 provides insights into the level of study habits and attitudes, focusing on the distribution of time and social relationships of the control group before the intervention**.**

Table 2.11 Level of Study Habits and Attitudes along with Distribution of Time and Social Relationship of the Control Group before the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. My study period is often too short for me to get "warmed up" and concentrated.	**2.54**	**Sometimes**
2. My time is wisely distributed; I manage my time so I have enough time to accomplish all my tasks.	**3.86**	**Generally**
3. I find it hard to force myself to finish my work by a certain time, under pressure; work is unfinished; inferior, or on time.	**2.75**	**Frequently**
4. I study with others rather than all by myself.	**3.04**	**Frequently**
5. My enjoyment of talking/gossiping with my	**3.46**	**Generally**

friends / listening to the radio / watching TV interfaces with my study.		
6. I spend too much time on comics, fiction, going on shows, etc., for the good of my school work.	**2.64**	**Frequently**
7. Too much social events like parties, dates, and trips interfere with school success.	**2.14**	**Sometimes**
8. Dislike of certain teachers and subjects interferes with my school's success.	**2.18**	**Sometimes**
9. Personal, family, and financial problems cause neglect of school work.	**2.18**	**Sometimes**
10. Inaccessibility of study materials interferes with my study.	**2.18**	**Sometimes**
Grand Mean	**2.70**	**Frequently**

On average, the control group frequently practiced the habits and attitudes related to study habits and external distractions specifically stated by the indicators before the intervention.

Of the 10 indicators, only the 2nd and 5th have means that fall in the "generally" descriptive equivalent. The 3.86 mean of the 2nd indicator indicates that most students in the control group generally managed their time effectively, allocating sufficient time to accomplish their tasks, however, the high mean of 3.46 in the 5th indicator suggests that students generally experienced significant interference from social activities and media consumption, which could detract from their study time and focus.

The means of the 3rd, 4th, and 6th indicators, 3.04, 3.46, and 2.75 respectively, imply frequent struggle with completing work under pressure, frequent engagement in peer learning rather than alone, and frequent precedence of entertainment over schoolwork.

The remaining half of the 10 indicators, generated means within the 1.80-2.59 range, described as "sometimes" in terms of the frequency of practice. Therefore, habits or attitudes such as perceiving study periods as too brief to achieve full concentration, involvement in too many social events that interfered with school success, dislike of certain teachers and subjects, neglect of school work due to personal, family, and financial problems, and intrusion of study caused by the inaccessibility of study materials are only experienced or practiced sometimes by the control group before the intervention. Low means show fewer problems in these indicators, thus suggesting positive study habits and attitudes along with the distribution of time and social relationships among the students in the control group before the intervention.

Level of Study Habits and Attitudes along with Distribution of Time and Social Relationship of the Control Group after the Intervention

Table 2.12 presents the level of study habits and attitudes related to the distribution of time and social relationships of the control group after the lesson.

Table 2.12 Level of Study Habits and Attitudes along with Distribution of Time and Social Relationships of the Control Group after the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. My study period is often too short for me to get "warmed up" and concentrated.	**2.96**	**Frequently**

2. My time is wisely distributed; I manage my time so I have enough time to accomplish all my tasks.	**3.25**	**Frequently**
3. I find it hard to force myself to finish my work by a certain time, under pressure; work is unfinished; inferior, or on time.	**3.04**	**Frequently**
4. I study with others rather than all by myself.	**3.61**	**Generally**
5. My enjoyment of talking/gossiping with my friends / listening to the radio / watching TV interfaces with my study.	**2.93**	**Frequently**
6. I spend too much time on comics, fiction, going on shows, etc., for the good of my school work.	**2.93**	**Frequently**
7. Too much social events like parties, dates, and trips interfere with school success.	**2.25**	**Sometimes**
8. Dislike of certain teachers and subjects interferes with my school's success.	**2.39**	**Sometimes**
9. Personal, family, and financial problems cause neglect of school work.	**2.93**	**Frequently**
10. Inaccessibility of study materials interferes with my study.	**2.71**	**Frequently**
Grand Mean	**2.90**	**Frequently**

The data shows that indicator 4 had the highest mean at 3.61, showing that students generally preferred studying with others rather than alone, which can promote better learning outcomes through collaboration as proven by the study of Rusli et. al. (2020).

Indicator 2 had a mean of 3.25, indicating that students frequently managed their time well enough to accomplish their tasks but could still improve. The third indicator scored 3.04, suggesting that students frequently struggled with completing tasks under pressure, potentially leading to unfinished or lower-quality work.

Furthermore, indicator 1, with a mean of 2.96, revealed that students often found their study periods too short to become fully engaged and concentrated. Both indicators 5, 6, and 9, with means of 2.93, indicated that distractions such as socializing, media consumption, and personal, family, and financial problems, frequently interfered with their studies and caused neglect of their schoolwork.

Indicator 10, with a mean of 2.71, suggested that students often faced issues accessing study materials, which could hinder their academic progress. Indicator 7 had a mean of 2.25, and indicator 8 scored 2.39, both indicating that social events and dislike for certain teachers or subjects sometimes interfered with their school success.

Overall, the grand mean of 2.90 suggests that the control group, in general, practices the habits and attitudes relating to the distribution of time and social relationships frequently after the intervention. The increase in the mean of the 4th indicator implies better habits in learning through collaboration, nevertheless, the decrease in the of the 2nd indicator and the increase in the means of the remaining indicators proves a bigger problem relating to time management, not finishing tasks when under pressure, interference of study caused by entertainment, social interaction and events, dislike of certain teachers and subjects, personal, family, and financial problems, and inaccessibility of learning materials.

This further illustrates that the control groups' habits and attitudes in the distribution of time and social relationships are better before the lesson than after.

Level of Study Habits and Attitudes along with Preparing and Taking Examination of the Experimental Group before the Intervention

The study habits and attitudes related to preparing and taking examinations of the experimental group before the intervention is disclosed by the table below.

Table 2.13 Level of Study Habits and Attitudes along with Preparing and Taking Examination of the Experimental Group before the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. When preparing for an examination, I study the first thing that comes along without logic or order.	**2.75**	**Frequently**
2. I memorize my notes rather than trying to understand, summarize, and interrelate them.	**2.75**	**Frequently**
3. I am unable to identify the important points in the lessons as a guide for the emphasis in my review.	**2.79**	**Frequently**
4. I try to do some "over learning" working beyond the point of immediate memory or recall.	**3.50**	**Generally**
5. I find myself too tired, sleepy, and listless to study efficiently.	**3.36**	**Frequently**
6. I have to study where I can smoke or eat.	**2.54**	**Sometimes**
7. I get nervous and confused when taking examinations.	**3.86**	**Generally**
8. I plan out in my mind the answer to subjective or essay-type examination questions before starting to write the answer.	**4.32**	**Almost Always**
9. I am careless in spelling and sentence construction.	**2.89**	**Frequently**
10. I am unable to finish examinations on time.	**2.00**	**Sometimes**
11. I finish my examination paper and turn in before the time without reviewing my answer.	**2.04**	**Sometimes**
Grand Mean	**2.98**	**Frequently**

As shown in the table, indicator 8, with the highest mean of 4.32, attests that students almost always plan their answers to subjective or essay-type questions before starting to write. This suggests a structured approach to handling essay questions, which is a positive habit.

Indicator 7, with a mean of 3.86, shows that students generally get nervous and confused when taking exams, highlighting a significant area of anxiety that could affect performance as claimed by Kaminske (2023). According to her study, anxiety interferes with our already limited working memory capacity, making it harder to focus and process information in anxiety-filled situations like exams.

Indicator 4, with a mean of 3.50, reflects that students generally engage in "over learning," suggesting they often go beyond immediate recall in their study practices. This can be beneficial for deeper

understanding and long-term retention. Indicator 5, with a mean of 3.36, reveals that students frequently feel too tired, sleepy, and listless to study efficiently, indicating a need for better rest and energy management strategies.

Indicators 1, 2, and 3, each with means of 2.75, suggest that students frequently study in an unstructured manner, memorize notes without fully understanding them, and struggle to identify important points in their lessons. This points to a need for improved study techniques and critical thinking skills. Furthermore, indicator 9, with a mean of 2.89, shows that students frequently exhibit carelessness in spelling and sentence construction, which can negatively impact their exam performance.

Lastly, indicators 10, 11, and 6, with means of 2.00, 2.04, and 2.54 respectively, reveal that students sometimes fail to finish exams on time, often submit their papers without reviewing their answers, and sometimes need to study in environments where they can smoke or eat. Though means are low in these indicators, they still suggest a need for better time management, review practices during exams, and a more conducive study environment.

Generally, the grand mean of 2.98 indicates that students frequently face challenges in their study habits and attitudes toward preparing for and taking exams.

Level of Study Habits and Attitudes along with Preparing and Taking Examination of the Experimental Group after the Intervention

Table 2.14 provides a comprehensive overview of the study habits and attitudes specifically discussions about preparation and and taking examination behaviors of the experimental group after an intervention.

Table 2.14. Level of Study Habits and Attitudes along with Preparing and Taking Examination of the Experimental Group after the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. When preparing for an examination, I study the first thing that comes along without logic or order.	**3.07**	**Frequently**
2. I memorize my notes rather than trying to understand, summarize, and interrelate them.	**3.32**	**Frequently**
3. I am unable to identify the important points in the lessons as a guide for the emphasis in my review.	**3.07**	**Frequently**
4. I try to do some “over learning” working beyond the point of immediate memory or recall.	**3.21**	**Frequently**
5. I find myself too tired, sleepy, and listless to study efficiently.	**2.89**	**Frequently**
6. I have to study where I can smoke or eat.	**2.57**	**Sometimes**
7. I get nervous and confused when taking examinations.	**3.39**	**Frequently**
8. I plan out in my mind the answer to subjective or essay-type examination questions before starting to write the answer.	**3.96**	**Generally**
9. I am careless in spelling and sentence construction.	**2.82**	**Frequently**
10. I am unable to finish examinations on time.	**2.89**	**Frequently**
11. I finish my examination paper and turn in before	**2.75**	**Frequently**

the time without reviewing my answer.		
Grand Mean	**3.09**	**Frequently**

The grand mean of 3.09 indicates that, on average, the group frequently exhibits the behaviors and attitudes listed. Starting with the highest mean of 3.96, indicator 8 shows that the group generally plans out answers to subjective or essay-type questions before writing. This suggests a strategic and thoughtful approach to exams, likely leading to more coherent and well-structured responses.

Indicator 7, with a mean of 3.39, indicates that members frequently get nervous and confused when taking exams which highlights a significant issue of exam anxiety. Next, the 2nd indicator's mean of 3.32, reveals that the group frequently memorizes notes rather than trying to understand, summarize, and interrelate them. This reliance on rote memorization can be detrimental, as it may hinder the ability to apply knowledge flexibly in different contexts (Rhodes, 2024).

Indicator 4 shows that the group frequently engages in "over learning," working beyond the point of immediate recall, implied by the mean of 3.21. While thorough preparation is beneficial, overlearning can lead to inefficiency and burnout.

Indicators 1 and 3 both have a mean of 3.07, indicating that the group frequently studies in a disorganized manner and struggles to identify key points in lessons. These habits suggest a lack of effective study strategies, which could impede academic progress.

Indicator 5, with a mean of 2.89, points to frequent issues with fatigue and listlessness during study sessions. Indicator 10, also with a mean of 2.89, shows that the group frequently struggles to finish exams on time. This indicates possible time management issues during exams, which can prevent students from demonstrating their full knowledge and abilities.

Indicator 9, with a mean of 2.82, suggests frequent carelessness in spelling and sentence construction while indicator 11, with a mean of 2.75, reveals that the group frequently finishes exams early without reviewing their answers. This lack of review can lead to avoidable mistakes and lower scores.

Lastly, indicator 6, with the lowest mean of 2.57, indicates that members sometimes need to study in environments where they can smoke or eat. This occasional behavior suggests potential distractions that could affect concentration and study quality.

In summary, the decrease in the means of indicators 4, 5, 7, and 9 signifies the adaptation of better habits and attitudes of the experimental group after the integration of ethnomathematics. However, the increase in the means of indicators 1, 2, 3, 6, 10, and 11, and the decrease in the means of the 4th indicator suggest worse habits in preparing and taking examinations after the intervention than before.

Level of Study Habits and Attitudes along with Preparing and Taking Examination of the Control Group before the Intervention

Table 2.15 provides an analysis of the study habits and attitudes, as to the behaviors related to preparing and taking examination, of the control group before an intervention.

Table 2.15 Level of Study Habits and Attitudes along with Preparing and Taking Examination of the Control Group before the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. When preparing for an examination, I study the first thing that comes along without logic or order.	**2.04**	**Sometimes**
2. I memorize my notes rather than trying to under-	**2.25**	**Sometimes**

stand, summarize, and interrelate them.		
3. I am unable to identify the important points in the lessons as a guide for the emphasis in my review.	**2.64**	**Frequently**
4. I try to do some "over learning" working beyond the point of immediate memory or recall.	**2.68**	**Frequently**
5. I find myself too tired, sleepy, and listless to study efficiently.	**3.43**	**Frequently**
6. I have to study where I can smoke or eat.	**2.07**	**Sometimes**
7. I get nervous and confused when taking examinations.	**2.93**	**Frequently**
8. I plan out in my mind the answer to subjective or essay-type examination questions before starting to write the answer.	**4.18**	**Generally**
9. I am careless in spelling and sentence construction.	**1.96**	**Sometimes**
10. I am unable to finish examinations on time.	**1.79**	**Sometimes**
11. I finish my examination paper and turn in before the time without reviewing my answer.	**2.68**	**Frequently**
Grand Mean	**2.60**	**Frequently**

With a grand mean of 2.60, it indicates that on average, the group frequently exhibits the habits and attitudes enumerated in the indicators.

The 8th indicator's mean (4.18), the highest, shows that the control group generally plans out their answers to subjective or essay-type questions before writing. This indicates a strong, strategic approach to answering such questions, suggesting that the group members are thoughtful and organized in this aspect of exam preparation.

Indicator 5 garnered the second highest mean of 3.43, which highlights that the group frequently experiences tiredness, sleepiness, and listlessness, which impedes efficient studying. This significant issue suggests that fatigue is a common barrier to effective study sessions for this group, potentially affecting their overall academic performance.

Next, indicator 7, with a mean of 2.93, indicates that the group frequently gets nervous and confused when taking examinations. This points to a notable issue of exam-related anxiety, which can adversely impact the ability to perform well under pressure.

Indicator 4, with a mean of 2.68, shows that the group frequently engages in "over learning," working beyond the point of immediate recall. While thorough preparation can be beneficial, this behavior might indicate inefficiency and the risk of burnout due to excessive studying.

Indicator 11, also with a mean of 2.68, reveals that the group frequently finishes exams early without reviewing their answers. This lack of review can lead to avoidable errors and lower scores, as students might miss correcting mistakes or improving their responses.

Indicator 3, with a mean of 2.64, indicates that the group frequently struggles to identify the important points in lessons for review emphasis. This suggests difficulties in discerning key concepts, which can hinder effective and focused study sessions.

Indicators 2 and 1, with means of 2.25 and 2.04 respectively, show that the group sometimes memorizes notes rather than understanding them and sometimes studies in a disorganized manner. These habits

indicate areas where the group could improve their study techniques to enhance comprehension and organization.

Indicator 6, with a mean of 2.07, suggests that the group sometimes needs to study in environments where they can smoke or eat. This occasional need for specific study conditions may introduce distractions that affect the quality of study sessions.

Indicator 9, with a mean of 1.96, indicates that the group sometimes is careless in spelling and sentence construction. Although not frequent, this carelessness can still impact the clarity and professionalism of their written responses.

Lastly, indicator 10, with the lowest mean of 1.79, shows that the group sometimes struggles to finish exams on time. This suggests that time management during exams is generally not a major issue for this group, though it still occurs occasionally.

Level of Study Habits and Attitudes along with Preparing and Taking Examination of the Control Group after the Intervention

The study habits and attitudes relating to preparing and taking examination of the control group after an intervention are presented in Table 2.16.

Table 2.16 Level of Study Habits and Attitudes along with Preparing and Taking Examination of the Control Group after the Intervention

Indicator	Mean	Descriptive Equivalent Rating
1. When preparing for an examination, I study the first thing that comes along without logic or order.	**2.93**	**Frequently**
2. I memorize my notes rather than trying to understand, summarize, and interrelate them.	**3.11**	**Frequently**
3. I am unable to identify the important points in the lessons as a guide for the emphasis in my review.	**3.39**	**Frequently**
4. I try to do some "over learning" working beyond the point of immediate memory or recall.	**3.29**	**Frequently**
5. I find myself too tired, sleepy, and listless to study efficiently.	**3.00**	**Frequently**
6. I have to study where I can smoke or eat.	**2.14**	**Sometimes**
7. I get nervous and confused when taking examinations.	**2.96**	**Frequently**
8. I plan out in my mind the answer to subjective or essay-type examination questions before starting to write the answer.	**3.39**	**Frequently**
9. I am careless in spelling and sentence construction.	**2.86**	**Frequently**
10. I am unable to finish examinations on time.	**2.43**	**Sometimes**
11. I finish my examination paper and turn in before the time without reviewing my answer.	**3.04**	**Frequently**
Grand Mean	**2.96**	**Frequently**

The table show that indicators 3 and 8 both have a mean score of 3.39, which is perceived as the highest among the indicators. Indicator 3 suggests that members of the group frequently struggle to identify the

important points in lessons for emphasis in their reviews. This indicates a significant challenge in discerning key concepts, which can hinder effective study sessions. Indicator 8, on the other hand, shows that the group frequently plans out answers to subjective or essay-type questions before writing, reflecting a strategic approach to these types of exam questions, which is a positive aspect.

Indicator 4, with a mean of 3.29, reveals that the group frequently engages in "over learning," working beyond the point of immediate recall. While dedication to thorough preparation is evident, this behavior might indicate inefficiency and the risk of burnout from excessive studying.

Indicator 2, with a mean of 3.11, suggests that the group frequently memorizes notes rather than understanding, summarizing, and interrelating them. Indicators 5 and 11, with means of 3.00 and 3.04 respectively, highlight that the group frequently experiences tiredness and listlessness during study sessions and tends to finish exams early without reviewing their answers. These issues suggest that fatigue is a common barrier to effective studying, and the lack of review can lead to avoidable mistakes in exams.

Indicator 1, with a mean of 2.93, indicates that the group frequently studies the first thing that comes along without logic or order. This disorganized study approach suggests a need for better study strategies and planning.

Indicator 7, with a mean of 2.96, points to frequent occurrences of nervousness and confusion during exams. This highlights ongoing issues with exam-related anxiety, which can negatively affect performance.

Indicator 9, with a mean of 2.86, suggests frequent carelessness in spelling and sentence construction. This carelessness can detract from the clarity and professionalism of written responses, affecting overall exam scores.

Indicators 6 and 10, with lower means of 2.14 and 2.43 respectively, show that the group sometimes needs to study in environments where they can smoke or eat and occasionally struggles to finish exams on time. These behaviors, while less frequent, still indicate potential distractions and occasional time management issues during exams.

The grand mean of 2.60 increased to 2.96 after the integration of ethnomathematics which indicates that, on average, the group still frequently exhibits the study habits and attitudes related to preparing and taking examinations specified by the 11 indicators. Although the grand means only increased by a fraction, the increase of the means of all the indicators, except for the 5^{th} and 8^{th}, signifies that students in the control group had less positive study habits and attitudes along with preparing and taking examinations after the intervention than before. The increase in the 8^{th} indicator's mean also affirms that students tend to be less likely to plan out in their minds answers for subjective or essay-type examinations before writing.

Differences between the Level of Study Habits and Attitudes of the Experimental and Control Groups before the Intervention

Table 3.1 presents the statistical analysis of the differences in the level of study habits and attitudes between the experimental and control groups before the integration of ethnomathematics in the experimental group.

Table 3.1. Significant Differences between the Level of Study Habits and Attitudes of the Experimental and Control Groups before the Intervention

Level of Study Habits and Attitudes	Mean	Degree of Free-dom	Mean Dif-ference	t-value	t-prob	Interpretation	Decision
Experimental	3.23	54	0.29	3.23	0.02	S	Reject H_0
Control	2.94						

Legend: NS – Not Significant S- Significant .05 level of significance

The table shows that the mean level of study habits and attitudes for the experimental group before the intervention is 3.23, whereas for the control group, it is 2.94. The mean difference between the two groups is 0.29. This difference indicates that the experimental group initially had a slightly higher frequency of the habits and attitudes enumerated in the study.

The degree of freedom for the t-test is 54, which typically represents the total number of participants minus the number of groups. The t-value, calculated to be 3.23, is a measure of the difference between the groups relative to the variability observed in the data.

The t-probability, or p-value, is 0.02. This value is below the threshold of 0.05, indicating statistical significance. As a result, the null hypothesis (H_0), which posits that there is no difference between the two groups' study habits and attitudes, is rejected. Thus, it could be concluded that there is a significant difference between the level of study habits and attitudes of the experimental and control groups before the intervention.

Differences between the Level of Study Habits and Attitudes of the Experimental and Control Groups after the Intervention

The t-test result for the difference between the level of study habits and attitudes of the experimental and control groups after the integration of ethnomathematics in the experimental group is revealed in Table 3.2

Table 3.2. Significant Differences between the Level of Study Habits and Attitudes of the Experimental and Control Groups after the Intervention

Level of Study Habits and Attitudes	Mean	Degrees of Free-dom	Mean Dif-ference	t-value	t-prob	Interpretation	Decision
Experimental	2.68	54	-0.28	-2.13	0.04	S	Reject H_0
Control	2.96						

Legend: NS – Not Significant S- Significant .05 level of significance

Following the intervention, the mean level of study habits and attitudes for the experimental group is 2.68, while for the control group, it is 2.96. The mean difference of -0.28 indicates that the experimental group's frequency of the behaviors and attitudes listed has decreased relative to the control group.

The degree of freedom for the t-test is 54, while the calculated t-value, is -2.13. The t-probability (p-value) is 0.04, which is below the significance threshold of 0.05. This indicates that the difference between the two groups is statistically significant. Consequently, the null hypothesis (H0), which posits no difference between the groups' study habits and attitudes, is rejected.

The results suggest that the intervention had a significant positive effect on the experimental group's study habits and attitudes, reducing the frequency of negative behaviors compared to the control group.

This finding aligns with past research indicating that ethnomathematics can effectively improve study habits and attitudes. For instance, the study of Sunzuma et. al (2021), affirmed that benefits such as motivation and interest, active involvement, and being able to link school concepts on Mathematics to real-life situations resulted from the use of ethnomathematics approaches.

Differences between the Level of Performance of the Experimental and Control Groups before the Intervention

The table below compares the pretest performance levels in Mathematics of the experimental and control groups before an intervention.

Table 4.1. Significant difference between the level of performance of the experimental and control groups before the intervention

Level of Performance in the Pretest	Mean	Degrees of Freedom	Mean Difference	t-value	t-prob	Interpretation	Decision
Experimental	15.46	54	1.25	-1.31	0.20	NS	Accept H_0
Control	14.21						

Legend: NS – Not Significant S- Significant .05 level of significance

As displayed in Table 4.a, the experimental group had a mean score of 15.46, while the control group had a mean score of 14.21, indicating a mean difference of 1.25 points in favor of the experimental group before the integration of ethnomathematics.

Statistical analysis using a t-test, with 54 degrees of freedom, produced a t-value of -1.31 and a p-value of 0.20. Since the p-value is greater than the level of significance of 0.05, the difference in mean scores is not statistically significant. This non-significance is denoted as "NS" (Not Significant), and the null hypothesis (H_0), which states that there is no significant difference between the groups' pretest performance levels, is accepted. Thus, it can be concluded that there was no meaningful difference in performance between the experimental and control groups before the intervention, ensuring that any subsequent differences observed can be attributed to the effects of the intervention rather than pre-existing disparities in performance.

Differences between the Level of Performance of the Experimental and Control Groups after the Integration of Ethnomathematics

Table 4.2 shows the t-test result which compares the posttest performance levels of the experimental and control groups after the integration of ethnomathematics in the experimental group.

Table 4.2. Significant difference between the level of performance of the experimental and control groups after the intervention

Level of Performance in the Posttest	Mean	Degrees of Freedom	Mean Difference	t-value	t-prob	Interpretation	Decision
Experimental	39.04	54	23.25	-11.91	0	S	Reject H_0
Control	15.79						

Legend: NS – Not Significant S- Significant .05 level of significance

The experimental group achieved a mean score of 39.04, significantly higher than the control group's mean score of 15.79, resulting in a mean difference of 23.25 points.

Statistical analysis revealed a t-value of -11.91 and a p-value of 0, indicating that the observed difference is highly significant. The decision to reject the null hypothesis (H_0) confirms that the intervention had a substantial positive impact on the experimental group's performance. This suggests that the integration of ethnomathematics effectively enhanced students' mathematical abilities compared to traditional methods used with the control group. This corroborates that of Harding (2021), who claimed that ethnomathematics benefits the classroom by improving student mathematics knowledge through focused conversations, productive mathematics struggles, guided inquiry, esteeming cultural knowledge, and dispositions of engagement and motivation. Thus, integrating ethnomathematics is highly encouraged as it positively affects students' performance

Relationship between the Level of Performance and Level of Study Habits and Attitudes of the Experimental and Control Groups before the Lesson

The relationship between students' Mathematical performance and study habits and attitudes of the experimental and control groups before the intervention is reflected in Table 5.1.

Table 5.1. Correlation of Mathematical Performance to the Study Habits and Attitude of the Experimental and Control Groups before the Intervention

Study Habits & Attitude / Performance	Experimental Group	Control Group
Reading and Note-Taking Technique	.202	-.005
Habits of Concentration	-.356	-.356
Distribution of Time and Social Relationships	-.251	-.296
Preparing and Taking Examination	-.365	-.215
As a Whole	-.300	-.319

** - *Correlation is significant at .01*

* - *Correlation is significant at .05*

The data shows that the relationship between the experimental group's level of performance in Mathematics and study habits and attitude as to reading and note-taking technique, habits of concentration, distribution of time and social relationships, and preparing and taking examinations are represented by the computed r-values of 0 .202, -.356, -.251, and -.365 respectively, with an r-value of -.300 as a whole.

As for the control group, r-values of -.005, -.356, -.296, -.215, reflects the relationship between students' performance and their study habits and attitudes specifically in reading and note-taking technique, habits of concentration, distribution of time and social relationships, and preparing and taking examinations. As a whole, the computed r value is -.319.

All of the numbers indicate no significant relationship between students' level of performance and study habits and attitudes towards Mathematics in both experimental and control groups before the lesson. This supports the result of the study by Tus et. al (2020) the relationship between study habits and academic performance is not significant. They did, however, go on to say that students should still be able to acquire the pattern of study habits because they are crucial to every student's learning, suggesting that understanding the significance of study habits can help students study more effectively. Additionally, a student's approach to learning can be greatly improved by comprehending and developing such habits.

Relationship between the Level of Performance and Level of Study Habits and Attitudes of the Experimental and Control Groups after the Lesson

Table 5.2 discloses the correlation analysis of the level of performance in Mathematics and study habits and attitudes of the experimental and control groups after the integration of ethnomathematics.

Table 5.2. Correlation of Mathematical Performance to the Study Habits and Attitude of the Experimental and Control Groups after the Intervention

Study Habits & Attitudes / Performance	Experimental Group	Control Group
Reading and Note-Taking Technique	.332	-.066
Habits of Concentration	-.242	-.140
Distribution of Time and Social Relationships	-.175	-.138
Preparing and Taking Examination	.066	-.107
As a Whole	.022	-.171

** - *Correlation is significant at .01*

* - *Correlation is significant at .05*

The r-value representing the relationship between the experimental group's performance level and their study habits and attitudes as to their reading and note-taking technique, habits of concentration, distribution of time and social relationships, and preparing and taking examinations, appeared to be 0.332, -0.242, -0.175, and 0.066 respectively, as displayed in the table. As for the control group, the r-value in the same area happened to be -0.066, -0.140, -0.138, and -0.107.

The results showed no significant relationship between the correlated variables. This suggests that students' study habits and attitudes have no direct bearing on their mathematical performance, just as they did before to the inclusion of ethnomathematics. This negates the claim of Capuno et. al (2019) and Hafari et. al (2019), that students' attitudes and their study habits are significant factors that affect their performance in Mathematics. Nonetheless,

Balsomo (2020) also affirmed in his study the opposite of the result of this study. According to him, the attitude of the learners towards Mathematics is a factor in determining the level of skills in solving mathematical word problem. Learner's attitude toward Mathematics can significantly affect their ability to learn and understand the subject. Furthermore, their anxiety and attitudes may greatly affect how they perceive their own Mathematical competence. These factors greatly accounted for the learners' positive attitude towards Mathematics and dilemmas.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings, the following conclusions are drawn:

Grade 8 students generally perform fairly satisfactorily in the pretest. In the post-test, however, students' performance may vary because of varied teaching strategies implored in class.

The grade 8 students frequently practice study habits and attitudes related to reading and note-taking, concentration, distribution of time and social relationships, and preparing and taking examinations.

Integration of ethnomathematics positively affects students' study habits and attitudes related to reading and note-taking, concentration, distribution of time and social relationships, and preparing and taking examinations.

Integration of ethnomathematics also enhances students' level of performance in Mathematics.

Students' level of performance in Mathematics and study habits and attitudes along with reading and note-taking, concentration, distribution of time and social relationships, and preparing and taking examinations have no significant relationship.

The developed enhancement program is very timely and appropriate.

Based on the findings and conclusion drawn, the following recommendations are proposed:

Teachers must constantly conduct pre and post-assessment to determine whether or if the implored teaching technique or intervention has a good impact on students' performance. By doing this, the teacher might modify her methods of instruction to better meet the needs of her students.

Ethnomathematics should be integrated into teaching mathematics as it was proven to create a positive effect both in students' study habits and attitudes, and academic performance.

Teachers should regularly assess students' study habits and attitudes to help them adopt healthier habits and alter negative attitudes that might impair their performances.

Future researchers venturing on the same topics are encouraged to include other variables like social status and teacher factor as correlates to be measured.

The training design should be submitted to the proper DepEd authorities especially to the researcher's school head for approval and when found meritorious, recommend such for use in the district or even in a larger area.

Acknowledgement

The researcher extends her heartfelt gratitude to her adviser, Dr. Agnes G. Torres, for her unwavering support and guidance throughout this journey. Additionally, she expresses deep appreciation to Dr. Ernest D. Padiwan for his invaluable assistance and mentorship, which played a crucial role in leading her to publish in the International Journal of Frontiers in Medical Research (IJFMR).

REFERENCES

A. JOURNALS, NEWSPAPER, MAGAZINES, ETC

1. Brown, J. S., Collins, A., & Duguid, P. (1989). *Situated cognition and the culture of learning*. Educational researcher, 18(1), 32-42.
2. Capuno, et al. (2019). *Attitudes, Study Habits, and Academic Performance of Junior High School Students in Mathematics*. International Electronic Journal of Mathematics Education, v14 n3 p547-561 2019
3. Collins, A., Brown, J. S., & Newman, S. E. (1988). *Cognitive apprenticeship.Thinking:* The Journal of Philosophy for Children, 8(1), 2-10.
4. Jafari, H., Aghaei, A., & Khatony, A. (2019). *Relationship between study habits and academic achievement in students of medical sciences in Kermanshah-Iran.* Advances in medical education and practice, *10*, 637–643. https://doi.org/10.2147/AMEP.S208874
5. Harding, J. L. (2021). *Ethnomathematics affirmed through Cognitive Mathematics and academic achievement: Quality Mathematics Teaching and Learning Benefits*. SpringerLink. https://link.springer.com/referenceworkentry/10.1007/978-3-030-44982-7_5-1
6. Hwang, S & Son, T (2021). *Students' Attitude toward Mathematics and Its Relationship with Mathematics Achievement*. Journal of Education and e-Learning Research, v8 n3 p272-280 2021
7. Le, V. H. (2021). *An Investigation into Factors Affecting Concentration of University Students.* Journal of English Language Teaching and Applies Linguistics, v3 1 0.32996/jeltal.2021.3.6.2

8. Mursalin, M. & Supriadi, S. (2019). *Didactic Design of Sundanese Ethnomathematics Learning for Primary School Students*. Int. J. Eval. Res. Educ. 2019, 18, 154–175.
9. Prahmana, R.C.I. & Istiandaru, A. (2019). *Learning set theory using shadow puppet: A study of Javanese ethnomathematics. Sustainability* 2021, 9, 2938.
10. Rabia, M., et.al (2017) "*A Study on Study Habits and Academic Performance of Students*." Vol. 7, No. 10, 891-897. International Journal of Asian Social Science.
11. Rusli, M. et. al (2020) "*Peer teaching: Students teaching students to*
12. *increase academic performance"* Wiley online library journal.
13. Sunzuma, et. al. (2021). *A Comparison of the Effectiveness of Ethnomathematics and Traditional Lecture Approaches in Teaching Consumer Arithmetic: Learners' Achievement and Teachers' Views*. Pedagogical Research, v6 n4 Article em0103 2021.
14. Sunzuma, G. & Maharaj, A. (2020). *Exploring Zimbabwean Mathematics Teachers' Integration of Ethnomathematics Approaches into the Teaching and Learning of Geometry*. Australian Journal of Teacher Education, v45 n7 Article 5 p77-93 Jul 2020.
15. Tus, J. et. al. (2020). *The Learners' Study Habits and its Relation on their Academic Performance*. International Journal of All Research Writing. Vol. 2 Issue 6 10.6084/M9.Figshare.13325177.V1.
16. Vitoria, L., Monawati, M., Fauzi, F., & Mislinawati, M. (2021). Assessing the Effect of an Ethnomathematics Teaching Material on Students' Understanding of Mathematics. JPP (Jurnal Pendidikan dan Pembelajaran).

B. UNPUBLISHED MATERIALS

1. Mapa, E. (2014) "*Correlation among Time Management, Study Habits and Academic Achievement of the Math Major Students".* Philippine Normal University, Negros Occidental Branch.

C. ELECTRONIC SOURCES

1. Alangui, W. (2017). *Ethnomathematics and Culturally Relevant Mathematics Education in the Philippines*. Retrieved December 3, 2023, from https://www.researchgate.net/publication/318675820
2. _Ethnomathematics_and_Culturally_Relevant_Mathematics_Education_in_the_Philippines
3. Cherry, K. (2023). *What Are the Gestalt Principles? An Overview of the Gestalt Laws of Perceptual Organization*. Retrieved December 6, 2023, from https://www.verywellmind.com/gestalt-laws-of-perceptual-organization-2795835.
4. Chi, C. (2023). *Philippines still lags behind world in math, reading, and science –PISA 2022*. Philstar. Global. Retrieved March 15, 2024, from https://www.philstar.com/headlines/2023/12/06/2316732/philippines-still-lags-behind-world-math-reading-and-science-pisa-2022
5. D'Ambrosio, U. (1987). *Ethnomathematics and Its Place in the History and Pedagogy of Mathematics. For the Learning of Mathematics*, 5(1), 44–48. Retrieved December 6, 2023, from http://www.jstor.org/stable/40247876
6. Fraser, C. G. , Folkerts, . Menso , Gray, . Jeremy John , Knorr, . Wilbur R. and Berggren, . John L. (2024, March 5). mathematics.
7. Frost, J. (2023). *Matched pairs design: Uses & examples.* Statistics By Jim. Retrieved March 15, 2023, from https://statisticsbyjim.com/basics/matched-pairs-design/
8. Encyclopedia Britannica. Retrieved March 03, 2024, from https://www.britannica.com/science/mathematics

9. Hassan, M. (2023, August 15). *Quasi-experimental research design - types, methods. Research Method.* Retrieved December 6, 2023, from https://researchmethod.net/quasi-experimental-design/
10. Magsambol, B. (2020). *PH Lowest among 58 Countries in Math, Science – Global Assessment*. Rappler Philippines. Retrieved March 15, 2024, from https://www.rappler.com/nation/filipino-students-lagging-behindmathsciencetimmsinternationalresults2019/#:~:text=The%20Philippines%20only%20scored%20297%20in%20mathematics%20and,among%20all%2058%20participating%20countries%20for%20both%20tests.
11. McCombes, S. (2019, September 3). *Descriptive Research Design: Definition, Methods and Examples. Scribbr.* Retrieved December 7, 2023, from https://www.scribbr.com/methodology/descriptive-research/.
12. McCombes, S. (2020, June 12). *Correlational Research: Definition, Methods and Examples. Scribbr*. Retrieved December 6, 2023, from https://www.scribbr.com /methodology/correlational-research/.
13. Pappas, C. (2014). *Instructional Design Models and Theories: Gestalt Theory.* Retrieved December 6, 2023, from https://elearningindustry.com/gestalt-theory
14. Shafer, L. (2018). *Exploring ethnic-racial identity*. Harvard Graduate School of Education. Retrieved December 8, 2023, from https://www.gse.harvard.edu/ideas/usable-knowledge/18/02/exploring-ethnic-racial-identity
15. Stafford Global. (2023). *How to teach a culturally responsive curriculum*. Stafford Global. Retrieved December 6, 2023, from https://www.staffordglobal.org/articles-and-blogs/education-articles-and-blogs/culturally-responsive-curriculum/#:~:text=A%20culturally%20responsive%20curriculum%20is%20a%20curriculum%20that,of%20a%20society%2C%20it%20also%20encourages%20intercultural%20understanding.
16. Trends In International Mathematics and Science Study (TIMSS) (2020). *TIMSS 2020 Results*. Retrieved March 15, 2024, from https://nces.ed.gov/timss/
17. Vinderine, S (2023). *How Math is Taught Around the World: Key Differences.* Retrieved March 15, 2024, from https://www.kidsinthehouse.com/blogs/kidsinthehouse2/how-math-is-taught-around-the-world-key-differences#Let%20Us%20Start%20with%20The%20Us