MATHDALI: AN INSTRUCTIONAL MATERIAL IN TEACHING MEASURES OF CENTRAL TENDENCY AND VARIABILITY AMONG GRADE 7 STUDENTS

Dahunan, Cris A.

Completed 2023

II. ABSTRACT

A. Research Title

“MATHDALI: AN INSTRUCTIONAL MATERIAL IN TEACHING MEASURES OF CENTRAL TENDENCY AND VARIABILITY AMONG GRADE 7 STUDENTS”

B. Name of Researcher

CRIS A. DAHUNAN

C. Date of TA Session

MAY 29, 2023

D. Summary

This study aimed to test the effectiveness of the contextualized instructional material called Mathematics Designed Alternative Learning Intervention (MathDALI) in teaching measures of central tendency and variability among Grade 7 students of Alejandra B. Tambago High School. This employed quantitative (quasi-experimental) and qualitative research methods and participated by twenty (20) selected Grade 7 students. DepEd Self-Learning Modules were used to teach the ten (10) respondents in the control group, whereas MathDALI Learning Modules were used to teach the other ten (10) participants in the experimental group.

The results of the pre-tests, post-tests, and summative tests, significant observations from the teacher's journal, and students' responses from structured interviews are the sources of data for this study. The

participants' pre- and post-test performances were compared using mean and descriptive scales. The difference between their performances in the summative tests was tested using a T-test for independent samples. Further, the observations and the responses collected were utilized to support the conclusions and recommendations of this study.

Results from the pre-tests indicate that every participant has a "low mastery" level. This revealed that before the intervention, they all had the same levels of mastery. After the implementation phase, the mastery level of the control group was elevated to the "Average Mastery" level, while the experimental group reached the "Moving Towards Mastery" level. These show that participants in the experimental group performed better than those in the control group. This analysis was confirmed in the t-test results, which revealed that there was a significant difference between the performances of the said groups. Results from structured interviews and observations from the teacher’s journal also revealed that learners from the experimental group felt more comfortable in the learning process than the participants from the control group.

These findings imply that MathDALI is an effective instructional material in teaching measures of central tendency and variability. Thus, this can be adopted by the Grade 7 Mathematics teachers as instructional material in teaching the same topic at the same grade level.

E. Conclusions

Based on the findings of the study, the following conclusions are formulated:

1. Participants from the experimental and control groups have the same mastery levels during the pre-tests.
2. Participants from the experimental group that utilized MathDALI learning modules performed better during the post-test than participants from the experimental group that used DepEd self-learning modules.
3. There is a significant difference between the performances of Grade 7 students in measures of central tendency and variability using MathDALI learning modules and DepEd Self-Learning Modules.
4. MathDALI be improved by adding more examples and fixing typographical errors in its content.

F. Recommendations

Based on the study's findings and the conclusion, the following are recommended:

1. Consider MathDALI learning modules as instructional material in teaching measures of central tendency and variability among Grade 7 students.

2. Consider the features of MathDALI in contextualizing learning materials in Mathematics.
3. MathDALI learning modules should be checked and validated by experts from the Division of Masbate Province for improvement and future publication in the learning portals.
4. Conduct more studies on the effects of using MathDALI on improving the students' performance in Mathematics 7 in the other schools for more reliable results.

III. ACKNOWLEDGEMENT

The researcher would like to give his utmost appreciation to the following for helping him accomplish this study.

First and above all, to the Almighty Creator, his Lord, God and Savior, Jesus Christ, for the providence, guidance, strength, and wisdom He gave the researcher to pursue and finish the study;

To his graduate school mentor, Dr. Cheryll V. Bermudo, who shared her expertise in crafting action research proposals;

To his tutor, Paul Jowen R. Blancaver, for giving the researcher technical assistance along his research journey;

To the Officer-In-Charge of the Planning and Research Office, Division of Masbate Province, Mr. Jason Barrun, for assisting him in the completion of the research paper;

To the rest of the Division Research Committee, for their sincere appraisal of this work, which contributed a lot to its total development;

To Mr. Felipe P. Ramirez II, the school head of Alejandra B. Tambago High School, for his overwhelming support and encouragement.

To the public schools' district supervisor, Dr. Marlene M. Inso, and to the district research coordinator, Letecia R. Abejero, for extending their support to the researcher.

To the teachers of Alejandra B. Tambago High School, in particular Mr. Julio J. De Castro, for suggesting "MathDALI" as the name of the instructional material used in this study, and to the class advisers and subject teachers of Grade 7 students for their support;

To his wife, Sheryl A. Dahunan, and his son, Criston Sam A. Dahunan, for always inspiring him to pursue this study.

To his parents, Mr. Samuel D. Dahunan and Mrs. Evelyn A. Dahunan, for the unconditional love given to the researcher.

To the respondents, who actively participated in the learning activities, and to their parents, who consented to their children to participate in the study.

To the unnamed people who contributed in one way or another to the making of this study;

This endeavor would not be possible without them: his profound gratitude is given to everyone.

TABLE OF CONTENTS

LIST OF FIGURES

List of Tables

IV. CONTEXT AND RATIONALE:

Mathematics is one of the important subjects that students should learn. It is useful in everyday living. Knowledge of this subject is essential in the workplace, major employers in engineering, construction, pharmaceutical, financial and retail sectors have all made the clear need for people with appropriate mathematical skills, even advanced economies need an increasing number of people with more than minimum qualifications in Mathematics to stay ahead in international competitiveness and to exploit advances in technology effectively (Akinoso, 2014). It is undeniable that this subject is significant in preparing learners for their future careers.

However, learners under the developing level of proficiency experienced difficulty in learning this subject and some of them perceived this learning area as a difficult one. In the Developing (D) level, the student possesses the minimum knowledge and skills, and core understandings, but needs help throughout the performance of authentic tasks (Rubrica, 2018). Moreover, students in this level are considered as learners with mathematical learning difficulties. Learners who are experiencing this learning difficulty have a problem making sufficient school progress in Mathematics similar to that of their peer group despite the implementation of effective teaching practices over time (Akinoso, 2014).

Siyang (2018) described Mathematics as an area of knowledge that can never be easily acquired and quickly learned; instead, it requires full attention, hard work, and a proper attitude. It is one subject in school where many students experience difficulty in understanding and where a teacher can effectively

intervene (Casing, 2018). Thus, this is a challenge for every mathematics teacher to learners with mathematical learning difficulties, particularly in this time of the “new normal” way of learning due to COVID-19 pandemic.

The SDO Masbate Province is initiating programs that address the learning gaps in Mathematics. These include simplified Learning Activity Sheets (LAS), Radyo Eskwela, and Brigada Bilang. These programs are being supported by the Palanas South District for its implementation. Moreover, Project StAR-Math or Student Academic Remediation in Mathematics is a school-based initiated program that was implemented in Alejandra B. Tambago High School in addition to the abovementioned initiatives by the division and district offices.

Alejandra B. Tambago High School adopted the modular distance learning during the SY 2019-2020, SY 2020-2021 and three quarters of the SY 2021-2022. Limited face-to-face classes were implemented during the last quarter of SY 2021-2022. However, the mean percentage scores (MPS) of the grade 7 learners in Mathematics during the said school years are below 80. It was further found out that lessons on measures of central tendency and variability were among the least learned.

The new mode of learning, absence of a capable family member who can assist the learners in answering the modules, absence or lacking of learning gadgets such as tablets and android phones, poor numeracy and literacy skills, more activities to accomplish in the modules, and the medium of instruction used in the instructional materials are some of the assumed contributing factors affecting the performance of the learners in the said learning area.

From the abovementioned factors, the researcher would like to focus in addressing the problems related to the medium of instruction used in the instructional materials. According to Siyang (2018), mathematical skills are often hard to acquire and master in a language unfamiliar to the learners. Thus, language is an important factor in learning and the use of mother tongue-based multilingual education (MTB-MLE) is needed.

In the study of Ricablanca (2014), it was concluded that when the pupils are exposed to mother tongue-based instruction, their level of achievement in the pretest, posttest, and retention test improve more than the achievement of the pupils in the English instruction. This is supported by Siyang (2018) in his conclusion that students who were taught using their mother tongue showed a remarkable learning gain than the students who are exposed to English instruction.

Hence, the mother tongue-based multi-lingual education (MTB-MLE) is proposed to be integrated to the instructional materials used in teaching the concepts of Mathematics. This learning innovation is called MathDALI or Mathematics Designed Alternative Learning Intervention.

V. ACTION RESEARCH QUESTIONS

This action research focused on testing the effectiveness of the learning material innovation called MathDALI to the selected participants from Grade 7 learners of Alejandra B. Tambago High School for the fourth quarter of the school year 2022-2023 whose level of proficiency is under “developing” and considered

as learners with mathematical learning difficulties. Specifically, it sought answers to the following questions:

1. What are the mastery levels of the respondents in measures of central tendency and variability in the pre-test?
2. What are the mastery levels of the respondents in measures of central tendency and variability in the post-test?
3. Is there any significant difference between performances of Grade 7 students in measures of central tendency and variability using MathDALI materials, and DepEd Self-Learning Modules?
4. How would MathDALI be improved as an instructional material in teaching measures of central tendency and variability?

VI. PROPOSED INNOVATION/INTERVENTION AND STRATEGY

A. The Innovation

This innovation is called Mathematics Designed Alternative Learning Intervention (MathDALI). This is a learning material that simplifies learning activities, and incorporates mother-tongue/multilingual approach in the presentation of the concepts in measures of central tendency and variability. This learning material innovation contains the introductory concepts of the lesson, learning competencies from the MELCs, vocabulary list with multilingual approach, activities, and discussion, assessment, references, and answer key.

The features of MathDALI are shown in the figure below.

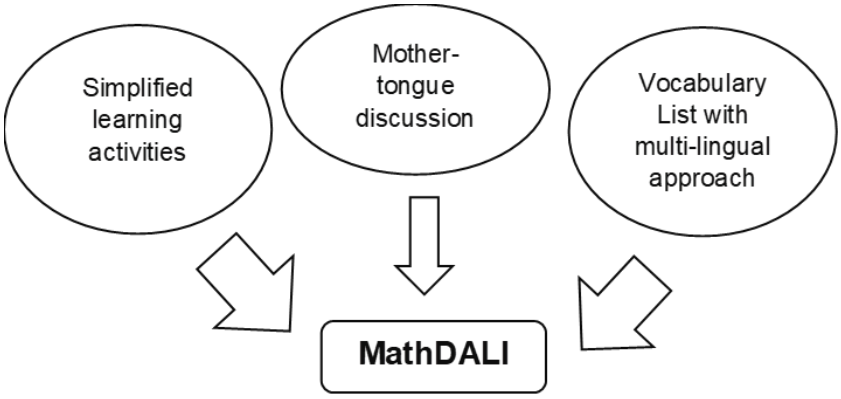


Figure 1: Features of MathDALI

B. The Intervention

MathDALI learning modules served as the main tool as an intervention and instructional materials in teaching measures of central tendency and variability. These were given to participants in a weekly basis before the presentation of the lessons. Learning activities and assessments in the MathDALI modules served as seatwork or homework of the students.

MathDALI and assessment materials were validated by the school quality assurance team for learning innovation materials and approved by the school head before its distribution to the participants.

The diagram below summarizes the process of producing MathDALI Materials:

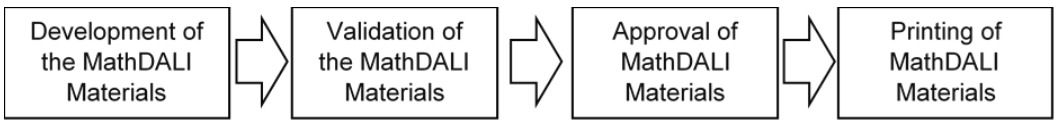


Figure 2: MathDALI production process

C. The Strategy

MathDALI learning modules were given to the experimental group and DepEd learning modules to the control group before the discussion of the lessons. These are the instructional materials used in teaching measures of central tendency and variability among grade 7 students within the last four weeks of the fourth quarter of the school year 2022-2023.

VII. ACTION RESEARCH METHODS

A. Participants of the Study

The participants of the study are the twenty (20) selected Grade 7 students in Mathematics of Alejandra B. Tambago High School (*Formerly Miabas National High School)* sections Rose and Daisy, whose grades in the third quarter for the School Year 2022-2023 are ranging from 75 to 79. Ten (10) from Grade 7 Daisy as members of the control group and another ten (10) from Grade 7 Rose as members of the experimental group.

B. Data Gathering Methods

This study employed quantitative (quasi-experimental) and qualitative research methods. Pre-tests and post tests were conducted every week before and after the discussions. Summative tests were also administered to the participants every after two weeks. Data collected were presented using tabular method.

The teacher-researcher created a journal along the journey of the implementation of the said study. This helped him to record significant

observations in the study. The researcher also conducted grouped and structured interviews to the participants using the approved set of questionnaires. Their responses were written in the sheets of paper provided.

C. Data Analysis Plan

The computed mean of the pre-test and post test results were compared using the “scale for mastery level of pupils” by Bayucca (2020).

Table 1: Scale for Mastery Level of Pupils (Bayucca, 2020)

SCORES	PERCENTAGE OF CORRECT RESPONSES	MASTERY LEVEL DESCRIPTION
18-20	96%-100%	Mastered
15-17	86%-95%	Closely Approximating Mastery
12-14	66%-85%	Moving Towards Mastery
7-11	35%-65%	Average Mastery
4-6	15%-34%	Low Mastery
1-3	5%-14%	Very Low Mastery
0	0-4%	Absolutely No Mastery

The mastery level descriptions presented in table 1 were used in providing descriptive interpretation of the mastery levels of the participants in the pre-tests and post-tests.

Results from the summative tests were interpreted using t-test for independent samples. Moreover, data gathered from the interview and journal

were used in presenting the final analysis of the study. The collected data were compared and triangulated that help the researcher answer the action research questions of this study.

VIII. DISCUSSION OF RESULTS AND REFLECTION

THE MASTERY LEVELS OF THE PARTICIPANTS DURING PRE-TESTS

Table 2: Interpretation of Pre-Test Results

PRE-TEST	Week No.	Average Score (Control Group)	Average Score (Experimental Group)
Pre-Test 1	1	6.10	5.3
Pre-Test 2	2	4.00	4.6
Pre-Test 3	3	5.60	5.5
Pre-Test 4	4	5.00	5.3
Mean		5.18	5.18
Interpretation		Low Mastery	Low Mastery

This study conducted weekly pre-test to check the prior understanding of the participants about the topic for the week. This was designed by the researcher to record the performances of the learners in each week, because every week, different modules were given to the participants. Pre-test 1 was conducted on Week 1 which covered the topic about “Measures of Central Tendency”, pre-test 2 was administered on Week 2 which included the topic about “Measures of

Variability". Pre-test 3 was given to the participants on Week 3 which covered the topic about "Analyzing and Interpreting Data", and pre-test 4 was scheduled on week 4 to evaluate the prior knowledge of the learners about "Drawing Conclusions from Statistical Data".

Table 2 shows the average scores and mastery levels of the participants during pre-tests. It was revealed that the average scores of the participants from the control group in pre-tests 1 and 3 are higher than the experimental group while during pre-tests 2 and 4, the experimental group's average scores surpassed the control group. Further, both groups gained equal mean of 5.18 in their average scores in four pre-tests. This score falls under "low mastery" level, which implies that they have the same mastery level before the discussions and the percentage of their correct responses in a 20-item pre-test is within 15%–24%.

THE MASTERY LEVELS OF THE PARTICIPANTS DURING POST-TESTS

Table 3: Interpretation of Post-Test Results

POST-TEST	Week No.	Average Score (Control Group)	Average Score (Experimental Group)
Post-Test 1	1	10.60	12.6
Post-Test 2	2	10.50	11.40
Post-Test 3	3	8.10	11.20
Post-Test 4	4	11.90	12.90
Mean		10.28	12.03
Interpretation		Average Mastery	Moving Towards Mastery

Weekly post-tests were conducted after the discussion to evaluate the progress of the learners' performance in the different topics using MathDALI and DepEd SLMs. The questions included in post-tests 1 to 4 covered the same topics included in the pre-tests. Post-tests 1 to 4 were conducted from week 1 to 4 of the implementation.

Table 3 presents the average scores and mastery levels of the participants in the four post-tests. It was shown that the average scores of the participants are consistent higher than the control group. It was also revealed that the mean of the experimental group which is 12.03, is higher than the mean of the control group which is 10.28. These imply that the mastery level of the participants in the control group is "Average Mastery" which means that their percentage of correct responses in 20-item post-tests is within 7%–11%. While participants from the experimental group hit the "Moving Towards Mastery" level which means that their percentage of correct responses in 20-item post-tests ranges from 35% to 65%. These results suggest that participants from the experimental group who used MathDALI learning modules performed better than the students from the control group who utilized DepEd Self-Learning Modules.

THE PERFORMANCES OF THE PARTICIPANTS IN MEASURES OF CENTRAL TENDENCY AND VARIABILITY

Table 4. t-test for Significant Difference in the Academic Performance of Students

Group	Mean	df	t-value	Critical Value	p-value	Interpretation
Control	14.8	18	2.2202	2.101	0.039483	Significant*
Experimental	17.5					

*at p<0.5

This study employed a t-test for independent samples because it was found that the average scores of the participants were normally distributed, as interpreted by the Kolmogorov-Smirnov test online calculator (see the results in *Annex 3*).

Since the t-computed value of 2.2202 is greater than the t-tabular value of 2.101 at the 0.05 level of significance with 18 degrees of freedom, this means that there is a significant difference between the performances of the control and experimental groups. This implies that MathDALI learning modules, which incorporate the use of mother-tongue based multilingual education (MTB-MLE) as the main feature, are more effective than DepEd SLMs, which use English as a medium of instruction, in teaching measures of central tendency and variability among Grade 7 students. This outcome is supported by the study of Englis & Boholano (2021), who cited that the use of the mother tongue in teaching

Mathematics is effective in acquiring mathematical knowledge and that learners could easily understand the lesson.

PARTICIPANTS PERCEPTIONS ON MATHDALI AND DEPED SLMS

In face-to-face instruction, the teacher must use instructional materials (IMs). These will help him to explain new concepts clearly, resulting in a better student understanding of the concepts being taught (Tuimur & Chemwei, 2015). MathDALI Learning Modules and DepEd Self-Learning Modules (SLMs) served as the IMs in teaching measures of central tendency and variability to the participants of this study.

Difficulties in The Use of DepEd SLMs Due to Unfamiliar Words

Participants from the control group who utilized DepEd SLMs experienced lots of learning difficulty because of the unfamiliar words in the modules and many learning activities to accomplish. Participant J explained that *"Naglisod ko kay daghan kaayo ug activities ug ang uban wala nako ma-answeran. Ang uban kay lisod kaayo sabton kay English [I'm having a hard time to learn because there are so many activities and some of them I couldn't answer. Some are very difficult to understand because the discussion is written in English language]."*

Participant D complained the DepEd SLMs, *"Maglisod jud kog sabot sa Math kay labi na kay English ang gamit. Dili kaayo nako masabotan maong usahay mangutana ko sa akong classmates ug teacher [It was difficult for me to understand Math because the language used is English. I don't understand much*

so sometimes I ask my classmates and teacher]." Participant F also shared his thoughts about the SLMs, *"Ang masasabi ko ay mahirap talaga dahil marami ang activities at hindi ko nga masagot lahat ng activities. At minsan mayroon pang word na hindi ko maintindihan, kailangan ko pang itanong sa aking guro, at nahihirapan din akong intindihin dahil English ang gamit. [What I can say is that it's really difficult because there are many activities and I can't answer them all. And sometimes there is a word that I don't understand, I have to ask my teacher, and I also struggle to understand because English is the medium of instruction used.]"*

Respondents from this group suggested that the DepEd SLMs should incorporate Bisaya or Tagalog in the presentation of the lessons. Participant E proposed that *"Mas angayan nga ang English na word ihobad sa Filipino para masabtan nako ug maayo. [It is better that the English words be translated into Filipino so that I can understand it better]."* Participant B supported this statement by saying, *"Mas nindot kung naay translation nga Bisaya ang module kay masabtan pa nako. [It would be better if the module has a translation in Bisaya so I can understand it.]"*

Thus, there is a need to incorporate mother-tongue in the learning modules to help them learn effectively. Learning activities in the SLMs should also be lessened and simplified so the learners will be able to accomplish the contents of the modules.

Easy Understanding of MathDALI SLMs Through Mother Tongue

Participants from the experimental group who utilized MathDALI found the translations and step-by-step solutions helpful to learn measures of central tendency and variability. Participant X gave a positive comment about this learning module and said "*Ang maingun nako sa module na MathDALI kay dali ra ko makasabot kay naay halo na Tagalog ug Bisaya. Dili pareha sa unang module na English. Mas angayan kini nga module kay dali kaayo masabtan. [What I can say about the MathDALI module is that I can easily understand it because it is a mixture of Tagalog and Bisaya. Unlike the previous module, which is English. This module is better because it is easy to understand.]"* Participant Q added*, "Mas sayon ang MathDALI kay naay translation. Dali lang masabtan unya naa poy mga example ug paliwanag. [MathDALI is easier because it has a translation. It's easy to understand with examples and explanations.]"*

When they experienced learning difficulty, they referred first to their modules and checked the step-by-step process before asking their classmates or teacher. Participant R from the experimental group detailed that *"Akong gihimo kay akong gibalik ang module kay para makabalo ko sa solution ug nangutana ko kay sir sa dili nako masabtan. [What I've done was, I checked back the module so I could know the solution and I asked my teacher to explain what I didn't understand.]"* Participants Q and W described MathDALI as "*Mas maayo o mas maganda ang MathDALI kay naay mga translation ug gi-usad usad ang pagpa-intindi o step-by-step ug may solutions ug gamay ra ang answeranan. [MathDALI*

is better because there are translations and step-by-step solutions, and there are few activities to answer.]"

These observations show that MathDALI learning modules are effective instructional materials in teaching measures of central tendency and variability among Grade 7 students. Falguera (2022) affirmed this result and mentioned that mother tongue-based is an effective medium of instruction in the teaching and learning of Mathematics.

Easy Understanding of MathDALI SLMs Through Vocabulary List

It was observed that learners from the experimental group were able to perform all the activities in the MathDALI learning modules. The majority of them understood the discussion in the module but still asked for the assistance of the teacher during the activity. When they encountered unfamiliar words, they referred to the vocabulary list. Participant Z explained that *"Mas dali ang pag-sabot sa mga words nga lawom kaayu ug dili dali masabtan kay naa may vocabulary list, nakatabang to siya sa akoa aron dili na ko mugamit ug dictionary. [It is easier to understand words that are deep and difficult to understand because there is a vocabulary list, it helped me so that I don't need to use a dictionary anymore.]"* Participant R found vocabulary list helpful because she said that, *"Nakatabang nako ang vocabulary list kay didto ko mutan-aw kung unsa ang meaning sa dili nako masabtan nga words sa module. [The vocabulary list helped*

me because I could look up the meaning of words in the module that I did not understand.]"

These statements imply that the "vocabulary list" feature of MathDALI is helpful in teaching and learning measures of central tendency and variability.

IMPROVING MATHDALI SLMS IN TEACHING MEASURES OF CENTRAL TENDENCY AND VARIABILITY

Most of the participants from the experimental group suggested adding more examples and designs to the MathDALI learning modules, and fixing some typographical errors. Participant T shared that "*Gusto nako na damo ang mga examples unya tarungon ang mga error unya gusto pud nako mudamo ang mga translation. [I want to increase the number of examples, then correct the errors, then I also want to increase the number of translations.]"* Other participants from the same group, except Participant W, have the same thoughts as Participant T. Participant W is convinced that the features of the MathDALI learning module are enough to help her learn. She shared that *"Para sa akin okay lang kahit wala nang baguhin dito dahil okay na sa akin yong ganitong simple lang naman. Kaya mas maganda kahit walang baguhin sa module sa Math. [For me it's okay even if there is nothing to change here because it's okay to be this simple. So, it is better if nothing is changed in the Math module.]"*

In addition, the researcher suggested that MathDALI learning modules should be checked and validated by the group of experts from the Division of

Masbate Province to ensure that these materials are error-free before publishing in the learning portals, because it was found that there are still some typographical errors in the modules. He also agreed on the proposal of the respondents to add more examples in the modules, because it was observed during the implementation that participants requested for more examples to discuss. Moreover, it was discovered by the researcher that there is a need to add simplified and practical preliminary activities in the modules before the discussion to stimulate the learners' interest about the topics. These recommendations will help this innovation become more effective instructional materials in teaching Mathematics.

The results from the quantitative and qualitative analysis of this study proved that MathDALI learning modules are effective instructional materials in teaching measures of central tendency and variability. Thus, these can be adopted by the Math 7 teachers as their tool in teaching Grade 7 students on the same topic.

IX. ADVOCACY, UTILIZATION AND DISSEMINATION

Results of this study were already shared with fellow Math teachers during Seminar-Workshop on Crafting MathDALI for information, possible adoption, and utilization of the innovation developed and applied.

Further, the researcher is planning to conduct another set of seminar-workshop or LAC session in the district level. Findings will also be communicated to the school officials, parents, SGC officers, Alumni Association Officers, and other school stakeholders during the School Stakeholders' Convergence. The researcher is also planning to present the results of the study in a research forum and publish them through a reliable research journal.

Republic of the Philippines
Department of Education
REGION V
SCHOOLS DIVISION OF MASBATE PROVINCE

SEMINAR-WORKSHOP ON CRAFTING MATHDALI INSTRUCTIONAL MATERIAL FOR ALEJANDRA B. TAMBAGO HIGH SCHOOL MATH TEACHERS

May 25, 2023

Alejandra B. Tambago High School Conference Hall

CRIS A. DAHUNAN
Proponent

FELIPE P. RAMIREZ II
School Head

Republic of the Philippines
Department of Education
REGION V
SCHOOLS DIVISION OF MASBATE PROVINCE

May 22, 2023

RAYMUNDO M. CANTONJOS, CESO VI
OIC-Schools Division Superintendent
Division of Masbate Province
Rodeo Road, Masbate City

Sir:

The undersigned researcher would like to request your good office to allow him to conduct a School Learning Action Cell (SLAC) session on May 25, 2023, from 7:30 a.m. to 5:00 p.m. for the Mathematics teachers of Alejandra B. Tambago High School to disseminate the results and findings of his completed action research titled "MathDALI: An Instructional Material in Teaching Measures of Central Tendency and Variability Among Grade 7 Students".

Further, he is also requesting to allow him to utilize the School MOOE for the expenses of the said activity.

Looking forward to your favorable response on this matter.

Respectfully yours,

CRIS A. DAHUNAN
Researcher

Noted:

FELIPE P. RAMIREZ II
School Head

Approved:

RAYMUNDO M. CANTONJOS, CESO VI
OIC-Schools Division Superintendent

Republic of the Philippines
Department of Education
REGION V
SCHOOLS DIVISION OF MASBATE PROVINCE

TRAINING/ACTIVITY PROPOSAL

I. Title:

Seminar-Workshop on Crafting MathDALI Instructional Material for Alejandra B. Tambago High School Math Teachers

II. Background

Mathematics is perceived as a difficult subject to teach and learn. This is a challenge for the teachers to think of strategies and innovations to make this learning area friendlier for the students to learn in, particularly for learners with difficulty understanding the language used in the learning materials. The medium of instruction used in the learning modules is one of the factors that affects the performance of the students during modular distance learning and even during face-to-face instruction.

The results of the study conducted titled: *MathDALI: An Instructional Materials in Teaching Measures of Central Tendency and Variability,* are relevant to share to the colleagues of the researcher in order for them to adopt the proven effective strategies in creating a contextualized instructional material in teaching Mathematics.

This seminar-workshop will help the Math teachers of Alejandra B. Tambago High School to contextualized their lessons and adopt the features of MathDALI in teaching Mathematics to the learners.

III. Objectives

This activity aims to:

1. Orient the results the action research conducted titled: *MathDALI: An Instructional Materials in Teaching Measures of Central Tendency and Variability Among Grade 7 Students* to the Mathematics teachers of Alejandra B. Tambago High School.
2. Craft a contextualized instructional material adopting the features of MathDALI.

IV. Strategies

This seminar-workshop will be conducted following the flow of the activities:

Learning and Development Process	*Expected Output*	*Remarks (Use the QAME Forms/Tools)*	*Expected Date of Conduct*
Pre-implementation			
Ask permission from the school head and PSDS on the training plan.	Letter Request		May 19, 2023
Preparation and submission of the letter request	Cover letter and training proposal		May 22, 2023
Preparation of training matrix and materials (MathDALI).	Training matrix and MathDALI materials		May 23-24, 2023

Program Implementation/Delivery			
Conduct a seminar-workshop on the adaptation of MathDALI	Powerpoint Presentation Slide and designed MathDALI materials		May 25, 2023
Post-Implementation			
Create a group chat to gather feedback and communicate the teacher-participants.	Group chat and summary of feedback.		May 26, 2023

V. Target Participants

The participants of this activity Mathematics teachers of Alejandra B. Tambago High School.

VI. Training Matrix/Program

Time	Activity/Topic
7:30 – 8:00 am	Registration
8:01 – 8:30 am	Opening Program
8:31 – 9:30 am	Topic 1: All About MathDALI
9:31 – 9:45 am	Health Break
9:46 – 10:45 am	Topic 2: Discussion of the Results of the Study
10:46 – 11:45 am	Open Forum and Feedback Giving
11:46 am– 12:59 pm	Lunch Break
1:00 – 3:00 pm	Crafting of MathDALI Materials
3:01 – 4:00 pm	Presentation of OUtputs
4:00 – 5:00 pm	Closing Program

VII. Fund Source

The researcher will request the PSDS and school head for the utilization of School MOOE as fund for this activity.

Prepared:

CRIS A. DAHUNAN
Proponent

Noted:

FELIPE P. RAMIREZ II
School Head

Recommending Approval:

CHERYLL V. BERMUDO
OIC-Assistant Schools Division Superintendent

Approved:

RAYMUNDO M. CANTONJOS, CESO VI
OIC-Schools Division Superintendent

Republic of the Philippines
Department of Education
REGION V
SCHOOLS DIVISION OF MASBATE PROVINCE

BUDGET PROPOSAL

Activity: Seminar-Workshop on Crafting MathDALI Instructional Material for Alejandra B. Tambago High School Math Teachers

Level: School ___
District ___
Division ___

Venue: Alejandra B. Tambago High School
Conference Hall
Miabas, Palanas, Masbate

Date: May 25, 2023

ITEM OF EXPENDITURE	Required Number	Cost	Total Number of Days	Total
Tarpaulin/Tarpapel (4' x 4')	1	P100	1	P100
Training Materials • Bond Paper • Printer Ink	1 ream 4 bottles	P280 P1300	1	P1580
Accommodation & Food (4 pax)	1 meal 2 Snacks	P150	1	P500

Prepared:

CRIS A. DAHUNAN
Proponent

Noted:

FELIPE P. RAMIREZ II
School Head

Recommending Approval:

CHERYLL V. BERMUDO
OIC-Assistant Schools Division Superintendent

Approved:

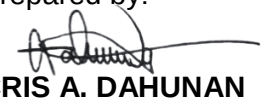
RAYMUNDO M. CANTONJOS, CESO VI
OIC-Schools Division Superintendent

COMPLETION REPORT

Program Title	**Seminar-Workshop on Crafting MathDALI Materials**
Facilitator	Cris A. Dahunan
Location & Venue	Alejandra B. Tambago HS Conference Hall
Date	May 25, 2023
No. of Participants	5
Summary of Attendance	Math Teachers – 5
Executive Summary	As part of the advocacy of the researcher to share the results and findings of the study conducted titled: "MathDALI: An Instructional Material in Teaching Measures of Central Tendency and Variability among Grade 7 Students", the seminar-workshop was conducted to the mathematics teachers of Alejandra B. Tambago High School. This activity aims to orient the teachers about the results of the study, discuss the features of the intervention material, and craft learning materials adopting the features of MathDALI. These are all helpful in improving the teaching techniques of the participants. The said workshop was approved by the Schools Division Superintendent and noted by the school head. It was facilitated by the researcher and proponent itself. The participants were actively engaged during the series of activities provided. Clarifications and feedback were entertained during the conduct of the activities. Certificate of participation were given to the participants.
Program Objectives	The activity aims to: 1. Orient the results the action research conducted titled: MathDALI: An Instructional Materials in Teaching Measures of Central Tendency and Variability Among Grade 7 Students to the Mathematics teachers of Alejandra B. Tambago High School. 2. Discuss the features of MathDALI Materials. 3. Craft a contextualized instructional material adopting the features of MathDALI.

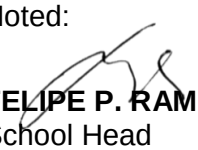
Program Schedule/Matrix Design	*See attached copy of the program/matrix*
Key Results and Outputs	Crafted MathDALI Materials
Resource Materials	Completed Action Research, MathDALI Materials
M & E Analysis	*See attached M & E Analysis report*
General Comments & Issues Encountered	The session did not start on time.
Recommendations	Always observe punctuality.
Financial Report	*See attached approved Budget Proposal*

Prepared by:



CRIS A. DAHUNAN
Proponent

Noted:



FELIPE P. RAMIREZ II
School Head

M & E ANALYSIS REPORT

Activity: Seminar-Workshop on Crafting MathDALI Materials
Venue: Alejandra B. Tambago High School Conference Hall
Date: May 25, 2023

Using the QAME form given to the participants, they rated the program evaluation for the Seminar-Workshop on Crafting MathDALI Materials by answering with Strongly Agree, Agree, Disagree and Strongly Disagree as responses. The table below shows the consolidated responses of the participants as they evaluated the activity.

Likert Scale
Program Evalution

	Training Evaluation	**SA**	**A**	**D**	**SD**	**Total**	**Mean**	**Mean^2**	**SD**
1	Content was well-organized.	5	0	0	0	5	4	16	3.4641
2	The training stated clear objectives.	5	0	0	0	5	4	16	3.4641
3	Questions were encouraged.	5	0	0	0	5	4	16	3.4641
4	Training meets my expectations.	5	0	0	0	5	4	16	3.4641
	Speaker Evaluation	5	0	0	0	5	4	16	3.4641
5	Communicates effectively with the audience.	5	0	0	0	5	4	16	3.4641
6	Is able to explain the topic thoroughly	5	0	0	0	5	4	16	3.4641
7	The speaker provides examples.	5	0	0	0	5	4	16	3.4641
8	The speaker able to answer the questions from the audience.	5	0	0	0	5	4	16	3.4641
	Venue and Accommodation	5	0	0	0	5	4	16	3.4641

9	The venue was well-lighted.	5	0	0	0	5	4	16	3.4641
10	The venue was well-ventilated.	5	0	0	0	5	4	16	3.4641
11	The venue was comfortable with sufficient space for program activities.	5	0	0	0	5	4	16	3.4641
12	The venue had sanitary and hygienic conditions with adequate comfort rooms.	5	0	0	0	5	4	16	3.4641
13	Meals were generally well-prepared and tasty, nutritious and sufficient in quantity and quality.	5	0	0	0	5	4	16	3.4641
14	The accommodation was comfortable with sanitary and hygienic conditions.	5	0	0	0	5	4	16	3.4641

Based from the data gathered, it was shown that 100% of the participants rated all the indicators “Strongly Agree”. The mean and the standard deviation also tell us that the participants were satisfied on all the aspects of the activity. All the mean was 4.0 and it signifies the contentment felt by the participants. Moreover, the standard deviation results are closer to the mean which signifies that the responses are less dispersed hence making the mean results valid and reliable.

All of the indicators received the highest mean rating of 4.0. Based on these results, it noted that the training activities are effective. In addition, the facilitators demonstrated efficiency in managing the overall the seminar-workshop.

Prepared:

CRIS A. DAHUNAN
Proponent

Noted:

FELIPE P. RAMIREZ II
School Head

Annex 6.f Program Evaluation

PROGRAM EVALUATION

Respondent Type: _____ Trainee _____ Trainer _____ Program Manager

Name (Optional) _____ Sex _____

Program Title: Seminar-Workshop on Crafting MathDALI Date: May 25, 2023

Direction: Please assess the effectiveness of the training program according to the indicators below. Put a tick/check under the appropriate column.

After the conduct of the training program, I believe that...	Strongly Agree	Agree	Disagree	Strongly Disagree
A. Program management				
1. The training program was delivered as planned	✓			
2. The training program was managed efficiently	✓			
3. The training Program was well-structured	✓			
B. Attainment of Objectives				
4. The program objectives were clearly presented	✓			
5. The program and session objectives were attained	✓			
C. Delivery of Content				
6. Program content was appropriate to trainees' roles and responsibilities	✓			
7. Content delivered was based on authoritative and reliable sources	✓			
8. The session activities were effective in generating learning	✓			
9. Adult learning methodologies were used effectively	✓			
10. Management of learning was effectively structured	✓			
11. Contribution of all trainees were encouraged	✓			
12. Trainees demonstrated a clear understanding of the content delivered	✓			
D. Provision of Support Materials				
13. The support materials provided were appropriate to the trainees' needs	✓			
14. Support materials provided were adequate and were given on time	✓			
E. Program Management Team				

15. Program Management Team members were courteous	✓			
16. Program Management Team was efficient	✓			
17. Program Management Team was responsive to the needs of trainees	✓			
F. Venue and Accommodation				
18. The venue was well lighted	✓			
19. The venue was well –ventilated	✓			
20. The venue was comfortable with sufficient space for program activities	✓			
21. The venue had sanitary and hygienic conditions with adequate comfort rooms	✓			
22. Meals were nutritious and sufficient in quantity and quality	✓			
23. Meals were generally well-prepared and tasty	✓			
24. The accommodation was comfortable with sanitary and hygienic conditions	✓			

Please provide your honest response to each of the following questions:

1. *What do you consider your most significant learning from the program?*
   In dealing with the learner's, it is more significant to use multi-lingual approach than the mother tongue alone.
2. *Briefly describe what you have learned and how it will help you with your work?*
3. *What changes would you suggest to improve similar programs in the future?*
   None
4. *What further comments do you have?*
   None

Source: NEAP – Central Office

SAMPLE OUTPUT

PERMUTATION

I. Introductory Concepts:

How does the concept of permutation help in formulating conclusion and in making wise decisions?

Permutation shows that our chances or choices to success in life wasn't meant for only one choice but are more than one. All we need to do is to find those possibilities.

II. Learning skills from the MELCs

Illustrates the permutation of objects. (M10SP-IIIa-1);

III. Vocabulary List with Multi-lingual approach

ENGLISH	FILIPINO	LOCAL DIALECT (SUGBUNG BINISAYA)
Arrange	Ayusin	E-arrange
Possible	Posible	Pusibli
Systematic	Maayos	Maayo
Closet	Kabinet	Kabinet
Occasion	Pagdiriwang	Okasyon
Shapes	Hugis	Purma
Row	Hilera	Linya
Diagram	Dayagram	Dayagram
Skirt	Palda	Sayal

IV. Activities and Discussion:

A. Activity 1

Directions. Answer the following questions.

1. How many ways you can arrange the four shapes in a row?
   (Pila ka beses pwede nimu e-arrange o ayuson ang upat ka purma sa linya)

A. 4 B. 12 C. 24

2. Five runners join in a race. In how many possible ways can they be arranged as first, second, and third places?
   (May lima kabuok nga nag apil sa kontes sa dagan. Sa pila ka beses nimu pwede ayuson sila na lima bilang first, second, third places?)

A. 5 B. 120 C. 60

Question:

A. How did you find the answer to each of the question?
   (Gi unsa nimu pagpangita sa answer?

B. Discussion

Permutation it refers to the possible arrangement of objects.

(Ang permutation kay ang mga pusibli nga pag arrange sa mga bagay)

Sample Illustrations

1. Using systematic listing method determine the permutation of the following.

Example: A close friend invited Anna to her birthday party. Anna has 4 new blouses (stripes, with ruffles,

long-sleeved, sleeveless) and 3 skirts (red, pink, black) in her closet reserved for such occasions.

Answer: blouse – stripes, with ruffles, long-sleeved, sleeveless.

Skirt – red, pink, black.

POSSIBLE OUTFIT

Blouse – skirt	***Blouse – skirt***	***Blouse – skirt***	***Blouse – skirt***
Stripes – red	ruffles –red	long-sleeved – red	sleeveless - red
Stripes –pink	ruffles – pink	long-sleeved –pink	sleeveless - pink
Stripes – black	ruffles – black	long-sleeved – black	sleeveless – black

Activity 2. ARRANGE US!

a. In how many ways can Lina, Maria and Faith arrange themselves in a row for a picture taking?

2. Using tree diagram answer the following question.

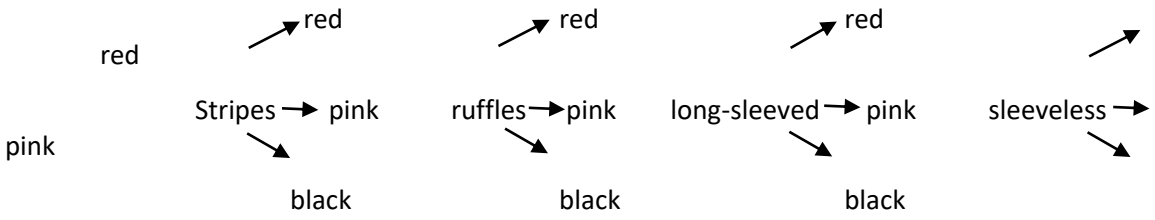
Example: A close friend invited Anna to her birthday party. Anna has 4 new blouses (stripes, with ruffles,

long-sleeved, sleeveless) and 3 skirts (red, pink, black) in her closet reserved for such occasions.

Answer: blouse – stripes, with ruffles, long-sleeved, sleeveless.

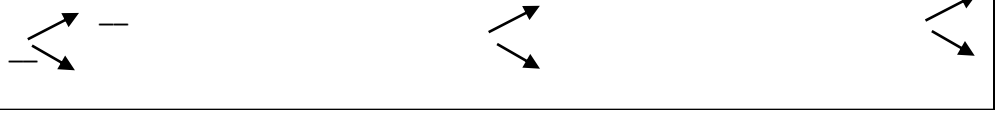
Skirt – red, pink, black.

POSSIBLE OUTFIT



Activity 3.

a. How many permutations are possible with all the letters of the word **YES?**

Possible arrangement


3. Solve the given using <u>fundamental counting principle</u>.

Example: Suppose you secured your bike using a combination lock. Later, you realized that you forgot the 4-digit code. You only remembered that the code contains the digits 1, 3, 4 and 7. How many possible codes are there?

Answer:
- ❖ 4! = 24
- ❖ (4)(3)(2)(1) = 24

Activity 4.

a. In how many ways can you place 9 different books on a shelf?

List all the possible three-letter arrangement in the word EAR.

X. REFERENCES

Akinoso S.O. (2014). Causes and Remedies of Students Mathematics Learning Difficulties in Nigerian Secondary schools. Journal of Mathematical Association of Nigeria (ABACUS). 39 (1), 219 – 233 https://www.researchgate.net/publication/342257966_Causes_and_Remedies_of_Students_Mathematics_Learning_Difficulties_in_Nigerian_Secondary_schools

Bayucca, S. A. (2020). The Effectiveness Of "Click Click" Teaching Strategy in The Academic Performance of Grade Six Learners in Mathematics. International Journal of Natural and Human Sciences Vol 1 No 2 (2020) 1–6

Casing, P. (2018). Improving Mathematics Performance Among Grade 11 Students Through Jigsaw Technique. Division of Zamboanga Sibugay. p. 5 https://www.academia.edu/44253228/IMPROVING_MATHEMATICS_PERFORMANCE_AMONG_GRADE_11_STUDENTS_THROUGH_JIGSAW_TECHNIQUE_An_Action_Research

Falguera, R. (2022). Effectiveness of Mother Tongue-Based Instruction on Grade 1 Pupil's Performance in Mathematics. International Journal of Advanced Multidisciplinary Studies. https://www.ijams-bbp.net/wp-content/uploads/2022/12/IJAMS-WLC-260-270.pdf

Englis, T. & Boholano, H. (2021). The Use of Mother Tongue in Teaching Elementary Mathematics. PSYCHOLOGY AND EDUCATION (2022) 59(2): 1-10 https://www.researchgate.net/publication/350276236_Mother_Tongue_-Based_Instruction_in_Teaching_Elementary_Mathematics

Ricablanca, J. D. (2014). Effectiveness of Mother Tongue-Based Instruction on Pupils' Achievement in Mathematics. Central Mindanao University. https://www.academia.edu/10401349/EFFECTIVENESS_OF_MOTHER_TONGUE_BASED_INSTRUCTIONON_PUPILS_ACHIEVEMENT_IN_MATHEMATICS

Rubrica, J. (2018). An Action Research on Project-Based Learning and Understanding by Design and their Effects on the Science Achievement and Attitude of Science Students. p. 48 https://files.eric.ed.gov/fulltext/ED585254.pdf

Siyang, E. L. T. (2018). The Use of Mother in Teaching Mathematics. International Journal of Education, Psychology and Counseling, 3 (20), 65-72. http://www.ijepc.com/PDF/IJEPC-2018-20-12-07.pdf

Tuimur, H. & Chemwei, B. (2015). Availability and Use of Instructional Materials in the teaching of Conflict and Conflict Resolution in Primary Schools in Nandi North District, Kenya. International Journal of Education and Practice, 2015, 3(6): 224-234. https://files.eric.ed.gov/fulltext/ED560670.pdf

https://www.socscistatistics.com/tests/studentttest/default2.aspx

https://www.socscistatistics.com/tests/kolmogorov/default.aspx

XI. FINANCIAL REPORT

Table 5. Cost Estimates

ACTIVITY	DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL AMOUNT
Crafting and Preparation of the Research Proposal and MathDALI Materials	Bondpaper (A4)	1 box	1125	**1125**
	Bondpaper (S)	2 reams	210	**420**
	Envelope (L)	10 pcs	7	**70**
	Envelope (S)	6 pcs	6	**36**
	Fastener	10 pcs	2	**20**
	Expanded Envelope	6 pcs	18	**108**
	Wifi Load	4 mos.	524.75	**2099**
Purchase of Snacks	Mineral Water	6 boxes	200	**1200**
	Cupcake	20 pcks	60	**1200**
Printing of Learning Modules	Printing	2000 sheets	2.931	**5862**
Submission of Research Proposal and Research Paper for Evaluation	Travel expenses	(2)	1430	**2860**

Table 6. Financial Report

ACTIVITY	CASH-OUT	BALANCE
BASIC EDUCATION RESEARCH FUND (BERF) FACILITY GRANT		Php 15,000
Crafting and Preparation of the Research Proposal and MathDALI Materials	Php 3878	Php 11 122
Purchase of Snacks	Php 2400	Php 8 722
Printing of Learning Modules	Php 5862	Php 2 860
Submission of Research Proposal and Research Paper for Evaluation	Php 2860	0