REPUBLIC OF THE PHILIPPINES
UNIVERSITY OF THE SOUTHERN MINDANAO
KABACAN, COTABATO

College of Science and Mathematics

BACHELOR OF SCIENCE IN APPLIED MATHEMATICS

LEVEL I
OCTOBER 26 - 30, 2026



AREA VI
Extension and Community Involvement

SYSTEM-INPUTS AND PROCESSES

S.1. There is a distinct office that manages the Extension Program.

The USM Research, Development, and Extension Committee



Dr. Jonald L. Pimentel
USM President – URDEC Chair



Dr. Debbie Marie B. Verzosa
Vice President for Research, Development, and Extension – URDEC Co-Chair



Dr. Lydia C. Pascual
Director, Research and Development Office



Dr. Glyn G. Magbanua
Director, Extension Services Office

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION



Dr. Florence Roy P. Salvaña
Director, Research Publication Services Office



Dr. Jurhamid C. Imlan
Director, USM Agricultural Research and Development Center



Dr. Jalaloden B. Marohom
Director, Intellectual Property, Technology Transfer and Business Development Office



Dr. Tamie C. Solpot
Director, Philippine Industrial Crops Research Institute



Mr. Bryan Lloyd P. Bretaña
Director, Office of International Affairs

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

Table of Organization



Glyn B. Gabano-Magbanua, Phd
ESO Director



Ritchel O. Torres
Training Specialist II



Laurence Arjay T. Mamburam
CBDEM Extension Coordinator



AP Warren A. Adamat
CVM Extension Coordinator



Joan P. Sadoral
CA Extension Coordinator



Cherie C. Mangaoang
CSM-Extension Coordinator



Ellen Joy M. Farala
CED Extension Coordinator



Rezeille May C. Amilbahar
CASS Extension Coordinator

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Glyn G. Magbanua
Graduate School Extension Coordinator



Marjurie V. Catuguran
CTI Extension Coordinator



Agripino N. Agulo Jr
CHS Extension Coordinator



Josephine C. Martinez-Buison
COM Extension Coordinator



Avegale S. Roy
CHEFS Extension Coordinator



Jassen Fe C. Calaoagan
CEIT Extension Coordinator



Ma. Karysa F. Garcia
KCC Extension Coordinator



Ali A. Ayob
IMEAS Extension Coordinator



Basser L. Wagia
PPALMA Extension Coordinator



Vinus P. Java
CHK Extension Coordinator



Bonifacio C. Solsoloy
NSTP Director



Rahima A. Cabunto
Education Program Specialist I



Diether M. Barro
Extension Assistant



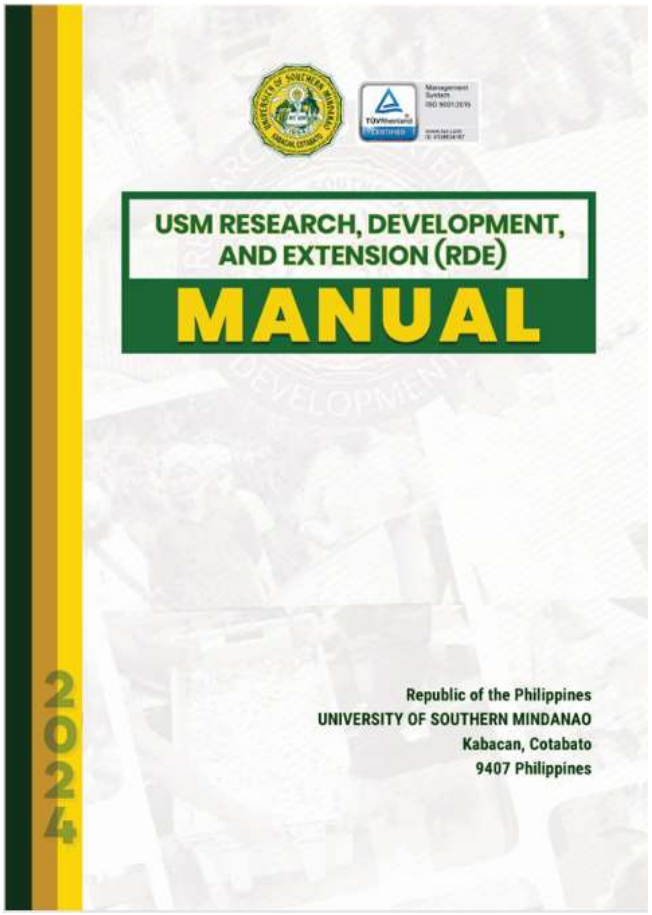
Arnabie A. Murray
Extension Project Staff



Jimwell P. Pande
Extension Editor and Staff

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

USM RDE Manual 2024



The USM Research, Development and Extension (RDE) Manual
Revised 2024

Approved by the USM Board of Regents (BOR) by virtue of Resolution No. 106, s. 2023
Revisions approved by the USM Board of Regents by virtue of Resolution No. 119, s. 2024

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and
Research Publication Services Office

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PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

University Extension Services Office





S.2. Instruments for monitoring and evaluation are available.

1. QUARTERLY MONITORING AND EVALUATION REPORT FOR EXTENSION

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

QUARTERLY MONITORING AND EVALUATION REPORT FOR EXTENSION

Project Title:		**Period Covered**	☐ 1st Quarter ☐ 3rd Quarter ☐ 2nd Quarter ☐ 4th Quarter
Proponent(s):		**Fund Source**	☐ Local _____ ☐ External _____

Activities *Based on the Work Plan Schedule*	**Outputs**	**Accomplishments**		**(%) Completion (Cumulative)**	**Problems Encountered** *(if any)*	**Action Taken**	**Fund Utilization (%)**	**Remarks by Evaluator**
		Target (%) *Based on the Milestone in the Workplan*	**Actual (%)**					
% Completion (Cumulative) from the previous quarter: _____ %								

Prepared by:

_____
Project Leader

Noted by:

_____
College Extension Coordinator

Evaluated by:

_____
Director, Extension Services Office

Concurred by:

_____
Vice President for Research, Development and Extension

From USM Website:
https://docs.google.com/document/d/1cPN8og8ze2JmsRfz0U1Z6YKLGFzlUTN7/edit?usp=drive_link&ouid=117590906191913124446&rtpof=true&sd=true

2. Activity Evaluation Forms



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Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

OVERALL TRAINING/ACTIVITY EVALUATION SHEET

Training Details (*to be filled out by the Training Management Team*)
Title of Training: _____

Date: _____ Venue: _____

Instructions: Please make an honest assessment of the activity by ticking on the box that represents your response.

Item	☹	☹	😐	☺	☺
Particulars	1	2	3	4	5
Course Content and Structure					
The objective of the activity was clearly stated at the beginning of the session					
The sequence of the topics was easy to follow					
There was sufficient time allocated for each topic					
The content of the session was clear and easy to understand					
Training Activities					
There were sufficient activities in the session					
The activities increased my knowledge and understanding					
The group activities encouraged my participation					
Methodology and Materials					
The instructional materials and presentation aids used helped me understand the topics better					
The delivery method (e.g. lecture, training, FGD, forum was suitable for the activity)					
The delivery method assisted my learning and understanding					
Training Management Team, Facilities and Services					
The activity was well-organized and facilitated					
The secretariat was approachable and helpful					
The venue was conducive for the activity					
Suggested activity/ training course in the future					

Name of Participant (Optional): _____



UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

RESOURCE PERSON EVALUATION SHEET

Topic/s Discussed (to be filled out by the training facilitator/s)	
Resource Person (to be filled out by the training facilitator/s)	

Based on the scale below, please rate the Resource Person Based on the following statements.

1	Poor	4	Very Satisfactory
2	Fair	5	Excellent
3	Satisfactory		

	☹	☹	😐	☺	☺
Particulars	1	2	3	4	5
The resource person displayed a thorough knowledge of the topic and was able to provide insights					
The resource person explained and processed the activities thoroughly					
The resource person sustained the attention of participants and encouraged their participation					
The resource person was able to create a good learning climate					
The resource person was able to manage their time well					
The resource person was sensitive to the participants' needs					
Comments					

From USM Website:

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https://docs.google.com/document/d/1ApoAFdwlJ4WpLNGBbpI_HP1oHw1vcz7N/edit?usp=drive_link&ouid=117590906191913124446&rtpof=true&sd=true

IMPLEMENTATION

I.1. The administration, faculty, students and other stakeholders of the College/Academic Unit of Mathematics/ Applied Mathematics participate in the planning and organization of Extension Program.

❖ Minutes of the meeting

Project Title: Strengthening Mother-Tongue Based Education of Elementary Teachers in DepEd Cotabato through Instructional Materials Development and Validation

Minutes of Meeting

Date: November 10, 2023
Time: 10:00 AM
Venue: Dean's Office

Attendance

- Philip Lester Benjamin
- Sandra Nanding
- Arnel Toledo
- Jennifer Pama
- Leorence Tandog
- Debbie Marie Verzosa
- Leonard Paleta
- Jupiter Pilongo
- Anna Jean Garcia
- Daryl Mae Mamon
- Roel Valenton
- Rowel Madio
- Lawton John Yabes
- Jeaneth Licaros
- Meriam Rubio
- Florie Jane Tamon

Agenda

1. Schedule of Field Visit to Nangaan Elementary School
2. Preparation of Materials for the Activity
3. Food and Transportation Arrangement

Discussion

- The team agreed to visit Nangaan Elementary School on November 16, 2023 (morning) to conduct pre-test activities and interviews with teachers.
- Learning materials such as instructional comics and project orientation program will be finalized and printed.
- Pre-test instruments for teachers will also be prepared.
- Arrozcaldo will be served to the pupils during the activity.
- Packed lunch will be provided for participating teachers.
- Two cars will be used for the field visit to accommodate team members and materials.

Meeting end at 12:30PM

Prepared by:

SANDRA N. NANDING
Project Member

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

Project Title: *Strengthening Mother-Tongue Based Education of Elementary Teachers in DepEd Cotabato through Instructional Materials Development and Validation*

Minutes of Inception Meeting

Date: November 16, 2023
Time: 9:00 AM
Venue: Nangaan Elementary School

Attendance:

- Philip Lester Benjamin
- Sandra Nanding
- Arnel Toledo
- Jennifer Pama
- Leorence Tandog
- Leonard Paleta
- Jupiter Pilongo
- Anna Jean Garcia
- Daryl Mae Mamon
- Jeaneth Licaros
- Meriam Rubio
- Florie Jane Tamon
- Romina Tacuken
- Bhai Magunto
- Muhaima Balayman
- Mona Alon
- Sarah Lumambas
- Amelaida Kasan
- Roshaida Kamensa
- Fatima Afdal
- Sarah Jean Sarapudin
- Mikko Angela Eliyas

Purpose of Meeting
To formally introduce the extension project to Nangaan Elementary School, establish collaboration, and gather input for the design and implementation of MTB-MLE instructional materials in mathematics.

Discussion

- The school principal expressed appreciation and full support, sharing that it was the first time the school received this kind of external support.
- Teachers shared that they experience difficulty understanding and teaching math, particularly fractions.
- They expressed the need for new strategies and techniques for teaching challenging math topics in a way that is easy for students to understand.
- The project team proposed a training session on Instructional Materials (IM) development, which was warmly welcomed by the teachers.
- Teachers agreed to collaborate in refining existing IMs, ensuring that materials are relevant, useful, and aligned with their classroom needs.
- A training session for teachers on how to develop and implement localized IMs will be scheduled soon.
- It was agreed that a group chat (GC) will be created to ensure smooth coordination and faster updates regarding training and other activities.

Meeting end at 11:00 AM

Prepared by:
SANDRA NANDING
Project Member

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

Minutes of Meeting

Date: March 28, 2025
Time: 10:00 AM

MEETING on Math Dept Extension

INITIAL PLANNING

✓MOA w/ Dept'd [c/o Mam Debbie] @✓

Schedule

Capacity building [April 4, 2025]

GS to join | Science Institute & Linguistics

- to attend
- training design
- laminate materials

w/draw not voted

f.) Needs assessment - interview teachers
c/o Bryan Flores those topics that
think needed

ii.) Capacity building

2 days

Workshop

speaker : lecturer online

topics: mathematics teaching
in development

non-routine problems

Ian Garcia (online) / Flor Francisco

Debbie Verzosa

Leonora Tandog

Jeanette Lisno] Re-echo ICME@Athens

Tentative Date: May 30-31, 2025 [Fri & Sat]

Venue: Graduate School

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

- Ask MSP Registrar to, 12, Ateneo about official receipts

Output of the seminar:

DepEd endorsement - to process @ Koronadal

Apply for CPD units

- Validation during workshop
- Template that they will use to enhance their IMs
- Action research [Reyes / Dr. Bill]

Topic: [SEMINAR]

1.) Development of representation approach - learning materials [Debbie Verzosa]
May 30, 8:30 - 10am / GS Hall

2.) Writing good action problems [Ian Garcia w/ Randy Mallari]
May 30, 10:30am - 12nn / GS Hall

3.) Workshop
1-3 pm

4.)
a. Action research [Arven Reyes]
May 30, 3pm / GS Hall

b. Design-based research [Lorraine Tarlac w/ Jeanette Licaros]
May 31, 8:30 am - 10am

5.) Workshop
Time: 10:30am

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

Committee:

Instructional Design / Application form / Eval Forms - [Ranel Ann Sandra]
Compile CVs in PRC template - Lawton Jaster
Financial projection - Daryl Manon
Certificates - Lawton / Jaster -
Pub Mat - Benjamin
Program of activities - Roel

Deadline: MONDAY [March 31, 2025]

Registration: Php 2,000
Registration Form: "I commit to attend"

Conference Chair: Benjamin / Tarday

Title:

Documentation/: Manuel Lisondra /
completion report DIST and PhD Students

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Planning Meeting for the 2025 Training-Workshop



PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

Minutes of Meeting

Date of Meeting: May 24, 2025
Time: 4:00 PM – 5:00 PM
Platform: Google Meet (Online)

Agenda

1. Final preparations for the May 30–31 training-workshop
2. Distribution of tasks and responsibilities

Attendance:

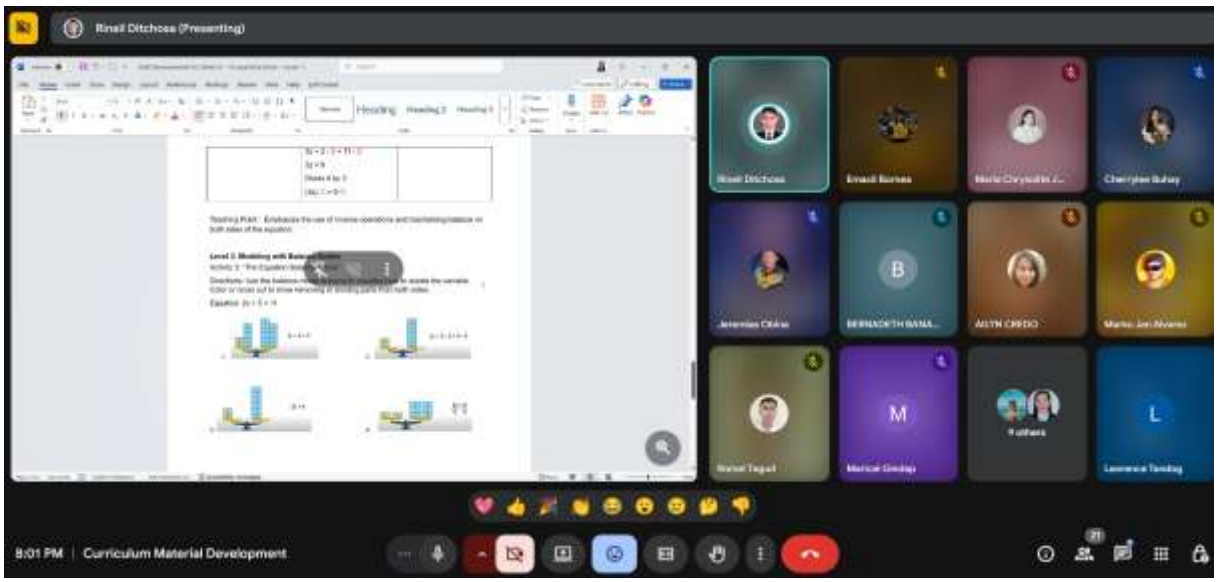
- Philip Lester Benjamin
- Sandra Nanding
- Arnel Toledo
- Jennifer Pama
- Leorence Tandog
- Debbie Marie Verzosa
- Leonard Paleta
- Jupiter Pilongo
- Anna Jean Garcia
- Daryl Mae Mamon
- Roel Valenton
- Rowel Madio
- Lawton John Yabes
- Jeaneth Licaros
- Jead Macalisang
- Fitzmee Ann Tamulak
- Hannah Jane Faith Palmos
- Jaymark Diaya
- Normaila Putong
- Dominic Carajay

Discussion

A. Task Checklist and Assigned Persons
   1. Venue Setup
      TV screen at the back
      White screen for projection
      Laptop assigned per TV screen
      In-charge: Jead Macalisang
   2. Audio Equipment
      5 wireless microphones
      2 for speakers
      2 for audience
      1 for emcee
   3. Backup batteries for mics
   4. Cooling Equipment
      2 electric fans (in case air-conditioning fails)
   5. Training Materials
      Markers
      Bond paper
      Manila paper
      Ballpens
      In-charge: Fitzmee Ann Tamulak
   6. Restroom Check
      Ensure comfort rooms (CR) are functioning and accessible
      In-charge: Jay Mark Diaya
B. All team members agreed to finalize preparations by May 29, 2025.
C. A short final coordination briefing will be scheduled prior to the workshop day.

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION







PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

I. PROJECT MANAGEMENT TEAM (PMT)

Project Leader and Activity Leaders:

Project Leader : **LEORENCE C. TANDOG** *(with Special Order)*
Component Leader : **PHILIP LESTER P. BENJAMIN** *(with Special Order)*
LEONARD M. PALETA *(with Special Order)*
JUPITER G. PILONGO *(with Special Order)*
DEBBIE MARIE B. VERZOSA *(with Special Order)*

Date	Activity	Responsible Persons	Core Topics Covered
March – May, 2026	Development of Learning Materials	1. Benjamin, Philip Lester P. 2. Garcia, Anna Jean S. 3. Madio, Rowel P. 4. Mamon, Daryl Mae C. 5. Nanding, Sandra A. 6. Paleta, Leonard M. 7. Pilongo, Jupiter G. 8. Tandog, Leorence C. 9. Verzosa Debbie Marie B. 10. DOST-SEI Project Strand-N Scholars, PhD Ed Math and MST Math students	IM 1: Reading and Writing Numbers IM 2: Introduction to Sets IM 3: Quantitative Reasoning & Data Sense – Making
June – July, 2026	Validation and Packaging of Learning Materials	1. Garcia, Anna Jean S. 2. Mamon, Daryl Mae C. 3. Nanding, Sandra A. 4. Paleta, Leonard M. 5. Pilongo, Jupiter G. 6. Tandog, Leorence C. 7. Verzosa Debbie Marie B. 8. Valenton, Roel S. 9. Yabes, Lawton John A. 10. DOST-SEI Project Strand-N Scholars, PhD Ed Math and MST Math students	
September – November, 2026	Implementation of Learning Materials	1. Benjamin, Philip Lester P. 2. Carajay, Dominic C. 3. Madio, Rowel P. 4. Pilongo, Jupiter G. 5. Sultan, Lidey 6. Tandog, Leorence C. 7. Verzosa Debbie Marie B. 8. DOST-SEI Project Strand-N Scholars, PhD Ed Math and MST Math students	

Date	Activity	Resource Persons	Core Topics Covered
May 30 -31, 2025 (2 Days)	Empowering Educators: Crafting Learning Materials and Design Implementing Design-Based Action Research	Ms. Aurea Puyos Dr. Ian June Garces Dr. Debbie Marie B. Verzosa Dr. Leorence C. Tandog Dr. Anna Jean S. Garcia Dr. Jonald L. Pimentel **Facilitators/ Moderators** 1. Benjamin, Philip Lester P. 2. Garcia, Anna Jean S. 3. Licaros, Jeaneth R. 4. Macalisang, Jead M. 5. Madio, Rowel P. 6. Magallon, Mauricio Jr. J. 7. Mamon, Daryl Mae C. 8. Nanding, Sandra A. 9. Paleta, Leonard M. 10. Palmos, Hannah Jane Faith 11. Pama, Jennifer 12. Pilongo, Jupiter G.	Lecture 1: Action Research Lecture 2: Writing Good Math Problems Lecture 3: Development of Representation Approach – Learning Materials Lecture 4: Design – based Research

I.2. The administration, faculty and students are involved in the implementation and dissemination of extension programs.

Jniversity of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

Work Plan

PROJECT TITLE: Strengthening mother-tongue based education of elementary teachers in DepEd Cotabato through instructional materials development and validation.

STARTING DATE: (01-01-23) | **COMPLETION DATE: (12-31-23)**

Activity No	Major/Sub-Activity	Anticipated Results	Responsible Person	Resources Required	J	F	M	A	M	J	J	A	S	O	N	D	Milestones
1	Obtain necessary permissions and approvals from relevant authorities	Obtained notice to proceed and approvals from barangay capitan	Philip Lester Benjamin, Sandra Nanding, Rowel Madio, Meriam Rubio	Bondpaper, printer, gasoline for travels													10%
2	Conduct profiling and needs assessment	Profile and needs of participants	Philip Lester Benjamin, Sandra Nanding, BSAM Students	Bondpapers, internet													20%
3	Development and refining of existing IMs	Developed and refined IMs	Philip Lester Benjamin Debbie Marie Verzosa Leorence Tandog	Bondpapers, printer, internet, gasoline for travels, etc													25%
4	Validation of the instructional materials	Validated IMs	Sandra Nanding Meriam Rubio	Bondpapers, printer, internet, gasoline for travels, etc													25%
5	Report writing	Final report	Philip Lester Benjamin Sandra Nanding	Bondpapers, printer, internet													20%

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

WORK PLAN SCHEDULE

PROJECT TITLE:	Strengthening Barangay High Schools: Validating and Implementing Representation Approach-Based Learning Materials for Independent Study of Mathematics in Remote Schools					
COLLEGE/ DEPARTMENT/ UNIT:	CSM/Math & Stat Dept./ BSAM students in collaboration with GS/MST and PhD Ed Math Programs					
PROPONENT (S):	Leorence Tandog					
Total Duration (in months)	12 months	**Planned Start**	January 2025	**Planned End**	December 2025	
			Schedule of Activities			
Activities	**Expected Outputs**	**Responsible Person**	**1st Quarter**	**2nd Quarter**	**3rd Quarter**	**4th Quarter**	**Milestone (%)**
1. Building Capacity of Teachers in Instructional Material Development (one day)	-30 teachers capacitated in IM development -design and sample lay-out of IM	L Paleta (RS) DB Verzosa (RS) L Tandog (RS) J Pilongo (F) R Valenton (F) S Nanding (F) PL Benjamin (M)	• Seminar-workshop • Initial Planning • Brainstorming				10%
2. Development of Representation Approach-Based Learning Materials for Independent Learning of Mathematics (two months)	-20 Learning Mathematics Activity Pages (LMAPS) produced thru lesson study	L Tandog (RS) DB Verzosa (RS) L Paleta J Pilongo (F) R Madio (F) S Nanding (F) PL Benjamin (F) AJ Garcia (F) DM Mamon (F)	• Brainstorming • Lesson Study • Writing • Design and Lay-out of LMAPS				50%

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

WORK PLAN SCHEDULE

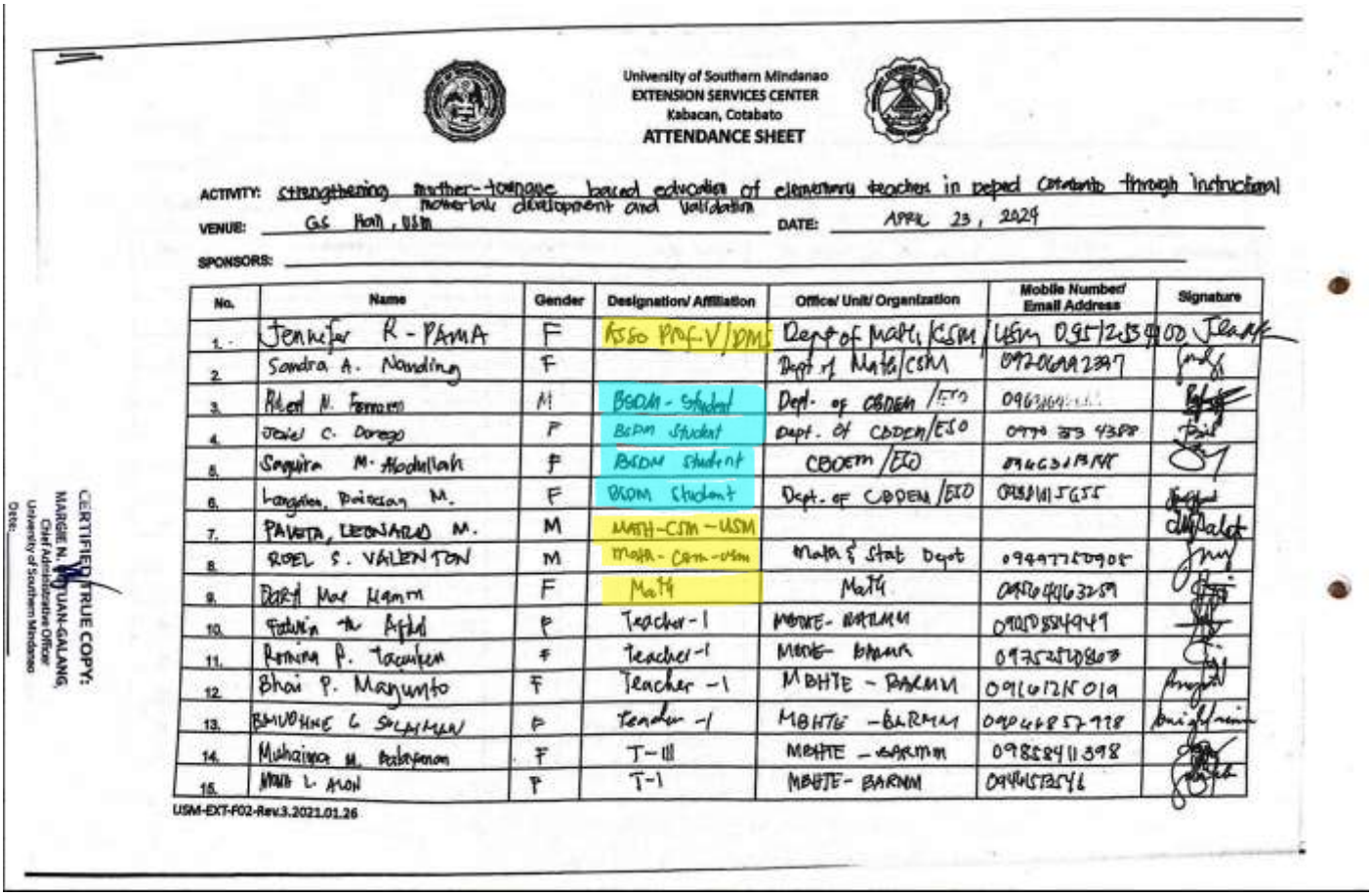
3. Validation and Packaging of Representation Approach-Based Learning Materials for Independent Learning of Mathematics (two months)	-20 validated and packaged LMAPS	J Pilongo (RS) L Tandog (RS) DB Verzosa (RS) L Paleta (F) R Valenton (F) S Nanding (F) AJ Garcia (F) DM Mamon (F) L Yabes (F)		• Validation & Pilot testing of LMAPS • Revision and Packaging of LMAPS			70%
Building Capacity of Teachers on Action Research (one day)	-10 partner teachers capacitated to implement action research using LMAPS	DB Verzosa (RS) L Tandog (RS) J Paleta (F) R Madio (F) R Valenton (M)		• Seminar-workshop • Initial Planning for action research			80%
Implementation of Representation Approach-Based Learning Materials for Improved Learning of General Mathematics (two months)		PL Benjamin (RS) L Tandog (F) DB Verzosa (F) J Pilongo (F) R Madio (F)			• Deployment & use of LMAPS by target beneficiaries • Pretest & Posttest	• Data analysis • Report writing & finalization	100%







PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION



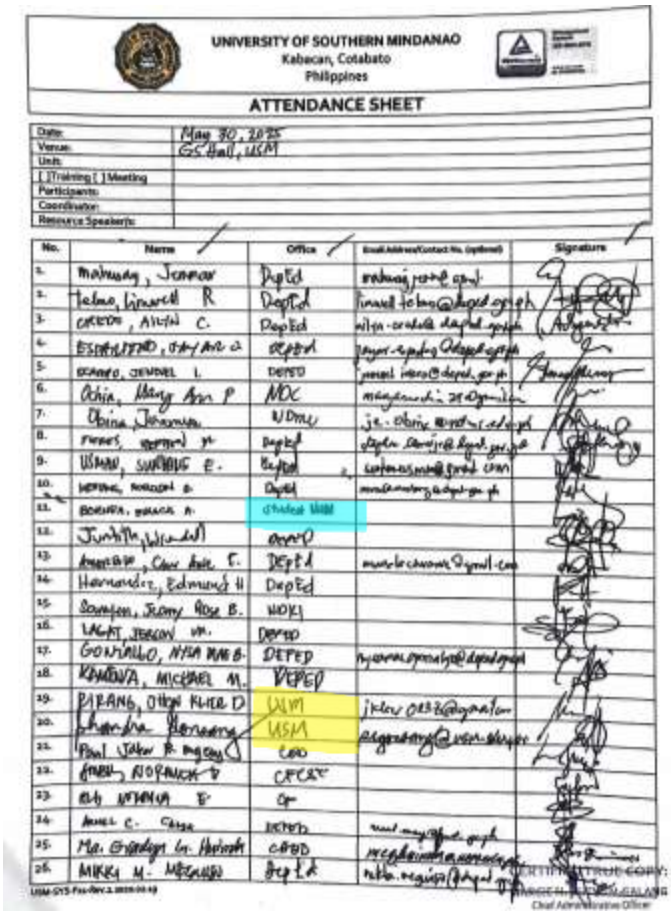
University of Southern Mindanao
EXTENSION SERVICES CENTER
Kabacan, Cotabato
ATTENDANCE SHEET

ACTIVITY: strengthening mother-tongue based education of elementary teachers in depED Cotabato through instructional materials development and validation
VENUE: GS Hall, USM DATE: APRIL 23, 2024
SPONSORS:

No.	Name	Gender	Designation/ Affiliation	Office/ Unit/ Organization	Mobile Number/ Email Address	Signature
1.	Jennifer R - PAMA	F	ASSO PROF V/DM3	Dept of Math, CSM	USM 095/2359400	
2.	Sandra A. Nonding	F		Dept of Math/CSM	09206442347	
3.	Rhed N. Fernan	M	BSEM - Student	Dept. of CBDEM/ETO	0963369[illegible]	
4.	Jeriel C. Dorego	F	BSEM Student	Dept. of CBDEM/ETO	0994 353 4388	
5.	Saquira M. Abdullah	F	BSEM Student	CBDEM/ETO	09462318NR	
6.	Langdon, Princess M.	F	BSEM Student	Dept. of CBDEM/ETO	09381115655	
7.	PAVETA, LEONARDO M.	M	MATH-CSM-USM			
8.	ROEL S. VALENTON	M	Math - Csm - usm	Math & Stat Dept	09497750905	
9.	Mary Mae Hamm	F	Math	Math	09506963259	
10.	Fatima Th Ajid	F	Teacher-I	MBHTE- BARMM	09105824949	
11.	Romina P. Tacuiken	F	Teacher-I	MBHTE- BARMM	09752[illegible]	
12.	Bhai P. Manguntu	F	Teacher -I	MBHTE - BARMM	09161245019	
13.	BANUHNE L SALAMAN	F	Teacher -I	MBHTE -BARMM	09264857998	
14.	Muhaimina M. Pasigporan	F	T-III	MBHTE - BARMM	09858411398	
15.	NAIB L. AMON	F	T-I	MBHTE- BARMM	09475125746	

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CERTIFIED TRUE COPY:
MARGIE N. [illegible]-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date:



UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

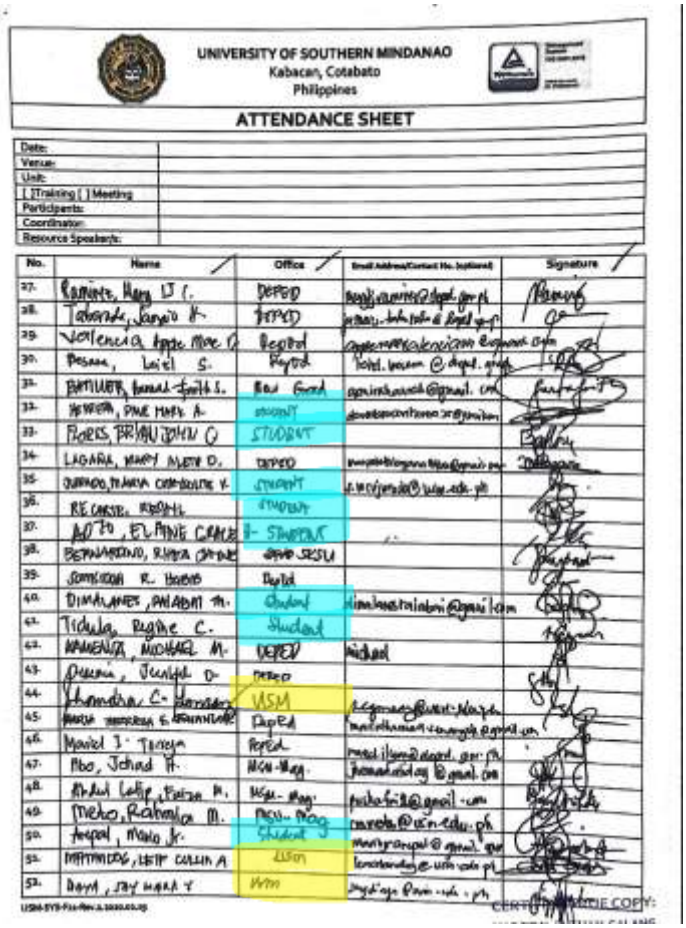
ATTENDANCE SHEET

Date:	May 30, 2025
Venue:	GS Hall, USM
Unit:	
[ ]Training [ ] Meeting	
Participants:	
Coordinator:	
Resource Speaker/s:	

No.	Name	Office	Email Address/Contact No. (optional)	Signature
1.	Mahinay, Jennifer	DepEd		
2.	Telmo, Linnard R	DepEd		
3.	CATEDOR, Alvin C.	DepEd		
4.	ESPARAGOZA, Mary Ann P	DepEd		
5.	RAMOS, JENNIEL L.	DEPED		
6.	Obina, Mary Ann P	MDC		
7.	Obina, Jessamin	USM		
8.	PONES, [illegible] M.	DepEd		
9.	USMAN, SUKRIEG E.	DepEd		
10.	[illegible]	DepEd		
11.	BORRES, [illegible]	Student USM		
12.	[illegible]	DepEd		
13.	[illegible]	DepEd		
14.	Hernandez, Edmund H	DepEd		
15.	Sompon, Jhamy Rose B.	MDKI		
16.	LAGAT, JERSON M.	DEPED		
17.	GONZALO, NYSA MAE B.	DEPED		
18.	KIMBUNA, MICHAEL M.	DEPED		
19.	PARANG, JOHN KLIER D	USM		
20.	[illegible]	USM		
21.	Paul John R. Magay	CDD		
22.	[illegible]	CPCSE		
23.	[illegible]	Op		
24.	[illegible]	DEPED		
25.	[illegible]	CBDD		
26.	MIKKA M. [illegible]	DepEd		

USM-SYS-Fss-Rev.3.2020.05.19

CERTIFIED TRUE COPY:
[illegible]
Chief Administrative Officer



UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

ATTENDANCE SHEET

Date:	
Venue:	
Unit:	
[ ]Training [ ] Meeting	
Participants:	
Coordinator:	
Resource Speaker/s:	

No.	Name	Office	Email Address/Contact No. (optional)	Signature
27.	Ramirez, Mary [illegible]	DEPED		
28.	Taborada, Jonard B.	DEPED		
29.	Valencia, Apple Mae O.	DepEd		
30.	Pesaca, Lariel S.	DepEd		
31.	BANTILAN, Ismael Smith S.	Bau Guard		
32.	[illegible]	STUDENT		
33.	FLORES, BRIAN JOHN O	STUDENT		
34.	LAGARA, MARY ALETH D.	DEPED		
35.	QUIMADO, FRANCIA CHARLOTTE V.	STUDENT		
36.	[illegible]	STUDENT		
37.	ADTO, ELAINE GRACE	STUDENT		
38.	[illegible]	[illegible]		
39.	[illegible]	DepEd		
40.	DIMARANAN, AMANAH M.	Student		
41.	Tidula, Regine C.	Student		
42.	KIMBUNA, MICHAEL M.	DEPED		
43.	[illegible]	DEPED		
44.	[illegible]	USM		
45.	[illegible]	DepEd		
46.	Manuel J. Teresa	DepEd		
47.	Abo, Jehad H.	MSU-Mag.		
48.	Abdul Latip, Faiza M.	MSU-Mag.		
49.	Tiscio, Rahmila M.	MSU-Mag.		
50.	Angeal, Mario Jr.	Student		
51.	[illegible]	USM		
52.	Dayot, Jay Mark Y	MSU		

USM-SYS-Fss-Rev.3.2020.05.19

CERTIFIED TRUE COPY:
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PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

University of Southern Mindanao
Kabacan, Cotabato
Philippines

College of Science and Mathematics

PROJECT MANAGEMENT TEAM (PMT) 2025

Project Title: Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools

Project Leader and Activity Leaders:

Project Leader : **LEORENCE C. TANDOG** *(with Special Order)*
Component Leader : **PHILIP LESTER P. BENJAMIN** *(with Special Order)*
LEONARD M. PALETA *(with Special Order)*
JUPITER G. PILONGO *(with Special Order)*
DEBBIE MARIE B. VERZOSA *(with Special Order)*

Date	Activity	Responsible Persons	Core Topics Covered
March – May, 2026	Development of Learning Materials	1. Benjamin, Philip Lester P. 2. Garcia, Anna Jean S. 3. Madio, Rowel P. 4. Mamon, Daryl Mae C. 5. Nanding, Sandra A. 6. Paleta, Leonard M. 7. Pilongo, Jupiter G. 8. Tandog, Leorence C. 9. Verzosa Debbie Marie B. 10. DOST-SEI Project Strand-N Scholars, PhD Ed Math and MST Math students, Undergrad student	IM 1: Reading and Writing Numbers IM 2: Introduction to Sets IM 3: Quantitative Reasoning & Data Sense – Making
June – July, 2026	Validation and Packaging of Learning Materials	1. Garcia, Anna Jean S. 2. Mamon, Daryl Mae C. 3. Nanding, Sandra A. 4. Paleta, Leonard M. 5. Pilongo, Jupiter G. 6. Tandog, Leorence C. 7. Verzosa Debbie Marie B. 8. Valenton, Roel S. 9. Yabes, Lawton John A. 10. DOST-SEI Project Strand-N Scholars, PhD Ed Math, MST Math students, Undergrad student	

Project Management Team (PMT) for College Extension Project (2025) Page 1 of 3

University of Southern Mindanao
Kabacan, Cotabato
Philippines

College of Science and Mathematics

September – November, 2026	Implementation of Learning Materials	1. Benjamin, Philip Lester P. 2. Cerajay, Dominic C. 3. Madio, Rowel P. 4. Pilongo, Jupiter G. 5. Sultan, Lidey 6. Tandog, Leorence C. 7. Verzosa Debbie Marie B. 8. DOST-SEI Project Strand-N Scholars, PhD Ed Math and MST Math students	
Date	**Activity**	**Resource Persons**	**Core Topics Covered**
May 30 – 31, 2025 (2 Days)	Empowering Educators: Crafting Learning Materials and Design Implementing Design-Based Action Research	Ms. Aurea Puyos Dr. Ian June Garces Dr. Debbie Marie B. Verzosa Dr. Leorence C. Tandog Dr. Anna Jean S. Garcia Dr. Jovald L. Pimentel **Facilitators/ Moderators** 1. Benjamin, Philip Lester P. 2. Garcia, Anna Jean S. 3. Lucaros, Jeaneth R. 4. Macalisang, Jead M. 5. Madio, Rowel P. 6. Magallon, Mauricio Jr. J. 7. Mamon, Daryl Mae C. 8. Nanding, Sandra A. 9. Paleta, Leonard M. 10. Palmos, Hannah Jane Farth 11. Pama, Jennifer 12. Pilongo, Jupiter G. 13. Tamulak, Filamee Ann D. 14. Toledo, Ariel B. 15. Valenton, Roel S. 16. Yabes, Lawton John A.	Lecture 1: Action Research Lecture 2: Writing Good Math Problems Lecture 3: Development of Representation Approach – Learning Materials Lecture 4: Design – based Research

Project Management Team (PMT) for College Extension Project (2025) Page 2 of 3

II. Documentation



I.3. The extension projects and activities serve varied clientele.

University of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

TRAINING COMPLETION REPORT

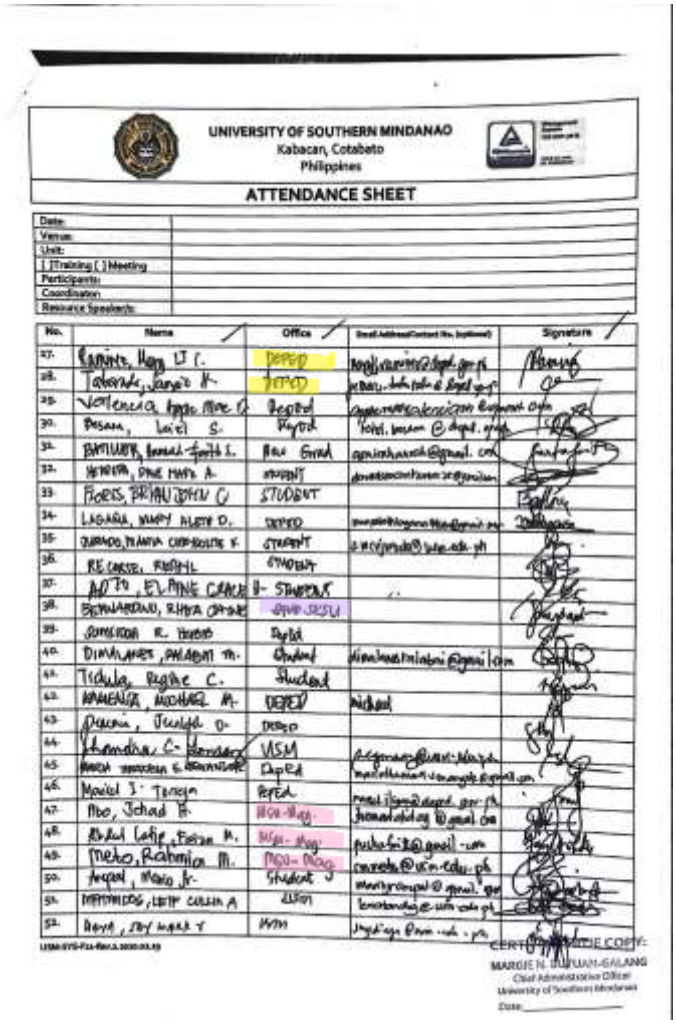
Report on non-degree training program (including seminars, conferences, workshops) conducted. This form should be submitted by the training coordinator to the monitoring office (OED) not later than 1 week after the completion of the training program.

Title	Strengthening Barangay High Schools: Validating and Implementing Representation Approach-Based Learning Materials for Independent Study of Mathematics in Remote Schools		
Budget	₱49,100.00	Fund Source	USM Extension Office/ Math Department
Start Date	May 30, 2025	End Date	May 31, 2025
Venue	Graduate School Hall, USM	No. of Beneficiaries/ Participants	70 Cotabato DepEd Teachers and students
Barangay	Poblacion	Municipality	Kabacan
Province	North Cotabato		

Training Team/ Facilitators
Faculty of Mathematics and Statistics Department, and PhD/MST USM students, DOST scholars, BSAM Students
Sponsor/s
College of Science and Mathematics/Graduate School, USM

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION





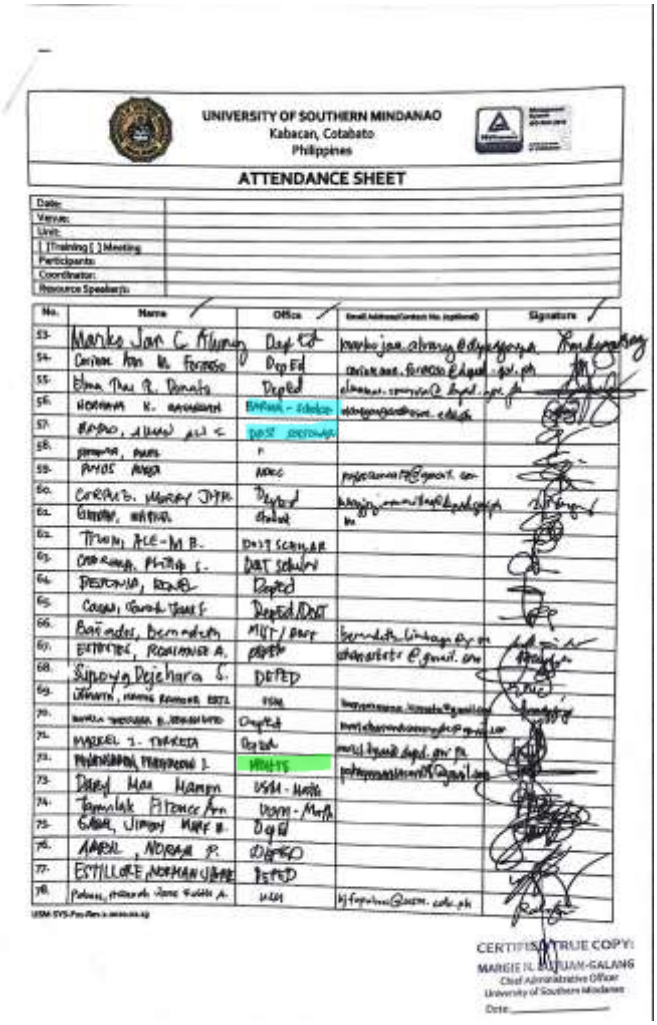
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

ATTENDANCE SHEET

Date:
Venue:
Unit:
[ ]Training [ ] Meeting
Participants:
Coordinator:
Resource Speaker/s:

No.	Name	Office	Email Address/Contact No. (optional)	Signature
27.	Ramos, Hazel U.	DepEd		
28.	Talavera, Janice K.	DepEd		
29.	Valencia, Kyla Mae C.	DepEd		
30.	Besas, Lael S.	DepEd		
31.	Bantilan, Ronald John L.	Alu Grad		
32.	Herrera, Dhe Mae A.	student		
33.	Flores, Brian John C.	STUDENT		
34.	Lagana, Mary Aleth D.	DepEd		
35.	Quirado, Maria Christelle F.	student		
36.	Recarte, Rachel	student		
37.	Alto, Elaine Grace B.	student		
38.	Bernardino, Rhea Grace	Grad Stud		
39.	Somerido R. Teodo	DepEd		
40.	Dimaampao, Shaidah M.	Student		
41.	Tidula, Regine C.	Student		
42.	Manalili, Michael M.	DepEd		
43.	Garcia, Jenifer D.	DepEd		
44.	Mendoza, C. Mendoza	USM		
45.		DepEd		
46.	Maniel J. Tenoso	DepEd		
47.	Abo, Jehad B.	MSU-Mag		
48.	Abdul Latip, Faizah M.	MSU-Mag		
49.	Mieko, Rahmila M.	MSU-Mag		
50.	Angel, Mario Jr.	Student		
51.	Matamoros, Leiji Cullen A.	USM		
52.	Reyes, Shy Angel Y.	USM		

CERTIFIED TRUE COPY:
MARGIE N. MAJUAN-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date:



UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

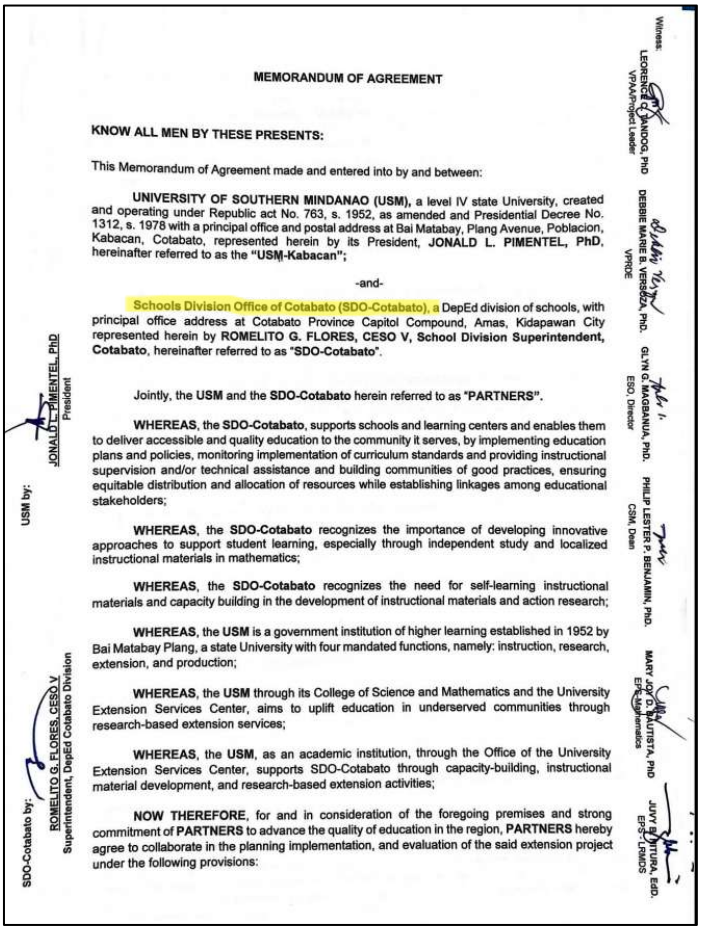
ATTENDANCE SHEET

Date:
Venue:
Unit:
[ ]Training [ ] Meeting
Participants:
Coordinator:
Resource Speaker/s:

No.	Name	Office	Email Address/Contact No. (optional)	Signature
53.	Marike Jan C. Alumay	Dep Ed		
54.	Carlon Ann M. Fonseca	DepEd		
55.	Elma Dau P. Donato	DepEd		
56.	Hofmina K. Mangudadatu			
57.	Bonito, Allan [illegible]			
58.	[illegible]			
59.	Apiag Mega			
60.	Corales, Mercy Joy	DepEd		
61.	Gimotea, Marital	student		
62.	Tiburan, Ace-Ma B.	DOST Scholar		
63.	Cabanilla, Philip S.	DOST Scholar		
64.	Pestonia, Ronel	DepEd		
65.	Casan, Gerald Jhon S.	DepEd/DOST		
66.	Bañadera, Bernadeth	MDT/DepEd		
67.	Estrope, Rosalinda A.	DepEd		
68.	Sipoyo, Rejehara S.	DEPED		
69.	[illegible]	USM		
70.	[illegible]	DepEd		
71.	Maniel J. Tenoso	DepEd		
72.	[illegible]	MSU-TC		
73.	Datu Hadji Hamja	USM - Main		
74.	Tomolak, Fitzgerald	USM - Main		
75.	Gabar, Jimboy Mar B.	DepEd		
76.	Abdul Norhan P.	DepEd		
77.	Estillore, Norhan Jhay	DepEd		
78.	Pelaez, Rolando Jose Pablo A.	USM		

CERTIFIED TRUE COPY:
MARGIE N. MAJUAN-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date:

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION



MEMORANDUM OF AGREEMENT

KNOW ALL MEN BY THESE PRESENTS:

This Memorandum of Agreement made and entered into by and between:

UNIVERSITY OF SOUTHERN MINDANAO (USM), a level IV state University, created and operating under Republic act No. 763, s. 1952, as amended and Presidential Decree No. 1312, s. 1978 with a principal office and postal address at Bai Matabay, Plang Avenue, Poblacion, Kabacan, Cotabato, represented herein by its President, **JONALD L. PIMENTEL, PhD,** hereinafter referred to as the **"USM-Kabacan";**

-and-

Schools Division Office of Cotabato (SDO-Cotabato), a DepEd division of schools, with principal office address at Cotabato Province Capitol Compound, Amas, Kidapawan City represented herein by **ROMELITO G. FLORES, CESO V, School Division Superintendent, Cotabato**, hereinafter referred to as **"SDO-Cotabato"**.

Jointly, the **USM** and the **SDO-Cotabato** herein referred to as **"PARTNERS".**

WHEREAS, the **SDO-Cotabato**, supports schools and learning centers and enables them to deliver accessible and quality education to the community it serves, by implementing education plans and policies, monitoring implementation of curriculum standards and providing instructional supervision and/or technical assistance and building communities of good practices, ensuring equitable distribution and allocation of resources while establishing linkages among educational stakeholders;

WHEREAS, the **SDO-Cotabato** recognizes the importance of developing innovative approaches to support student learning, especially through independent study and localized instructional materials in mathematics;

WHEREAS, the **SDO-Cotabato** recognizes the need for self-learning instructional materials and capacity building in the development of instructional materials and action research;

WHEREAS, the **USM** is a government institution of higher learning established in 1952 by Bai Matabay Plang, a state University with four mandated functions, namely: instruction, research, extension, and production;

WHEREAS, the **USM** through its College of Science and Mathematics and the University Extension Services Center, aims to uplift education in underserved communities through research-based extension services;

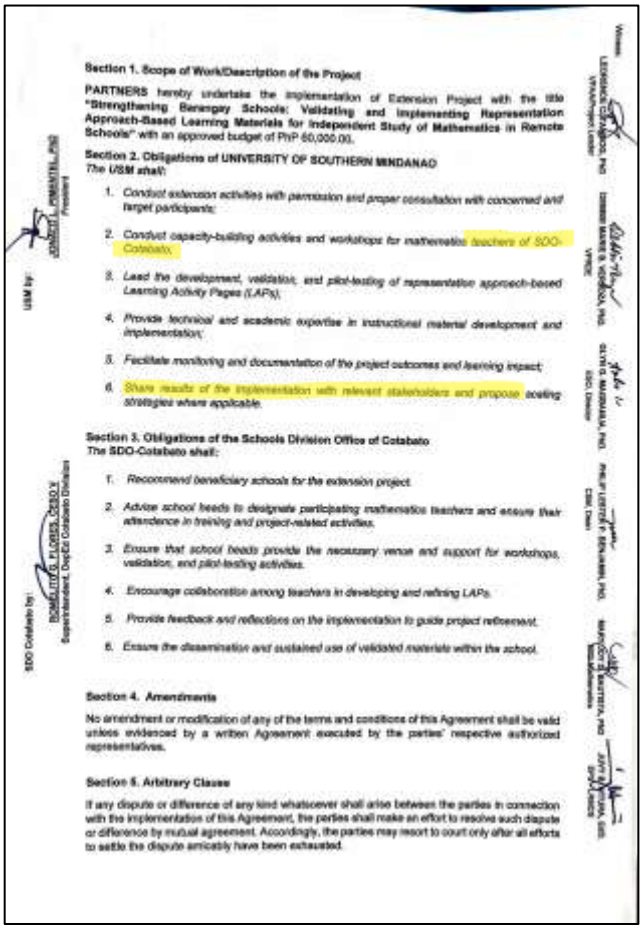
WHEREAS, the **USM**, as an academic institution, through the Office of the University Extension Services Center, supports SDO-Cotabato through capacity-building, instructional material development, and research-based extension activities;

NOW THEREFORE, for and in consideration of the foregoing premises and strong commitment of **PARTNERS** to advance the quality of education in the region, **PARTNERS** hereby agree to collaborate in the planning implementation, and evaluation of the said extension project under the following provisions:

Witness:
LEORENCE C. TANDOG, PhD
VPAA/Project Leader
DEBBIE MARIE B. VERZOSA, PhD
VPRDE
GLYN G. MAGBANUA, PhD.
ESO, Director
PHILIP LESTER P. BENJAMIN, PhD.
CSM, Dean
MARY JOY D. BAUTISTA, PhD
EPS-Mathematics
JUVY B. NITURA, EdD.
EPS-LRMDS

USM by:
JONALD L. PIMENTEL, PhD
President

SDO-Cotabato by:
ROMELITO G. FLORES, CESO V
Superintendent, DepEd Cotabato Division



Section 1. Scope of Work/Description of the Project

PARTNERS hereby undertake the implementation of Extension Project with the title **"Strengthening Barangay Schools: Validating and Implementing Representation Approach-Based Learning Materials for Independent Study of Mathematics in Remote Schools"** with an approved budget of PhP 60,000.00.

Section 2. Obligations of UNIVERSITY OF SOUTHERN MINDANAO
The USM shall:

1. *Conduct extension activities with permission and proper consultation with concerned and target participants;*
2. *Conduct capacity-building activities and workshops for mathematics teachers of SDO-Cotabato;*
3. *Lead the development, validation, and pilot-testing of representation approach-based Learning Activity Pages (LAPs);*
4. *Provide technical and academic expertise in instructional material development and implementation;*
5. *Facilitate monitoring and documentation of the project outcomes and learning impact;*
6. *Share results of the implementation with relevant stakeholders and propose scaling strategies where applicable.*

Section 3. Obligations of the Schools Division Office of Cotabato
The SDO-Cotabato shall:

1. *Recommend beneficiary schools for the extension project.*
2. *Advise school heads to designate participating mathematics teachers and ensure their attendance in training and project-related activities.*
3. *Ensure that school heads provide the necessary venue and support for workshops, validation, and pilot-testing activities.*
4. *Encourage collaboration among teachers in developing and refining LAPs.*
5. *Provide feedback and reflections on the implementation to guide project refinement.*
6. *Ensure the dissemination and sustained use of validated materials within the school.*

Section 4. Amendments

No amendment or modification of any of the terms and conditions of this Agreement shall be valid unless evidenced by a written Agreement executed by the parties' respective authorized representatives.

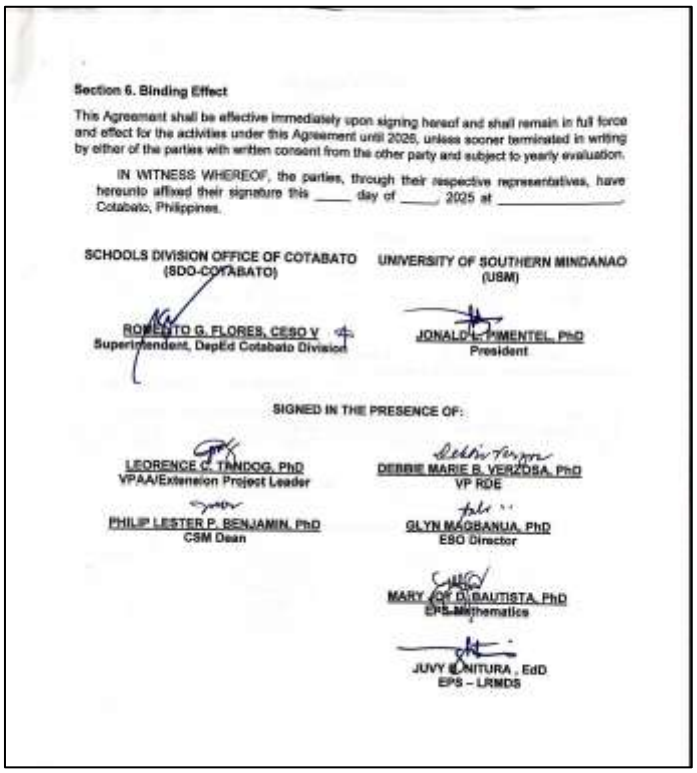
Section 5. Arbitrary Clause

If any dispute or difference of any kind whatsoever shall arise between the parties in connection with the implementation of this Agreement, the parties shall make an effort to resolve such dispute or difference by mutual agreement. Accordingly, the parties may resort to court only after all efforts to settle the dispute amicably have been exhausted.

Witness:
LEORENCE C. TANDOG, PhD
VPAA/Project Leader
DEBBIE MARIE B. VERZOSA, PhD
VPRDE
GLYN G. MAGBANUA, PhD.
ESO, Director
PHILIP LESTER P. BENJAMIN, PhD.
CSM, Dean
JUVY B. NITURA, EdD.
EPS-LRMDS

USM by:
JONALD L. PIMENTEL, PhD
President

SDO-Cotabato by:
ROMELITO G. FLORES, CESO V
Superintendent, DepEd Cotabato Division



Section 6. Binding Effect

This Agreement shall be effective immediately upon signing hereof and shall remain in full force and effect for the activities under this Agreement until 2026, unless sooner terminated in writing by either of the parties with written consent from the other party and subject to yearly evaluation.

IN WITNESS WHEREOF, the parties, through their respective representatives, have hereunto affixed their signature this ____ day of ____, 2025 at _____, Cotabato, Philippines.

SCHOOLS DIVISION OFFICE OF COTABATO (SDO-COTABATO)	UNIVERSITY OF SOUTHERN MINDANAO (USM)
ROMELITO G. FLORES, CESO V Superintendent, DepEd Cotabato Division	JONALD L. PIMENTEL, PhD President

SIGNED IN THE PRESENCE OF:

LEORENCE C. TANDOG, PhD
VPAA/Extension Project Leader

DEBBIE MARIE B. VERZOSA, PhD
VP RDE

PHILIP LESTER P. BENJAMIN, PhD
CSM Dean

GLYN MAGBANUA, PhD
ESO Director

MARY JOY D. BAUTISTA, PhD
EPS-Mathematics

JUVY B. NITURA , EdD
EPS – LRMDS



ACKNOWLEDGMENT

REPUBLIC OF THE PHILIPPINES)
Municipality of Kabacan, Cotabato) S. S.

BEFORE ME, a Notary Public, for and in the Municipality of Kabacan, Cotabato, this ___ day of APR 14 2025, personally appeared:

	ID No.	Issued on/Issued at
ROMELITO G. FLORES, CESO V		
JONALD L. PIMENTEL, PhD	[illegible]	[illegible]

Known to me are the same person(s) who executed the foregoing Memorandum of Understanding and they acknowledged to me that the same is of their own will and voluntary act and deed and that of the institutions they represent.

The foregoing instrument refers to a Memorandum of Understanding (MOU), consisting of three (4) pages, including the page in which this Acknowledgement is written, signed by the parties, including their instrumental witnesses on each and every page thereof and sealed with my Notarial Seal.

WITNESS MY HAND AND SEAL, on the date and place above written.

NOTARY PUBLIC

Doc. No. 318
Page No. 76
Book No. 44
Series of 2025

ATTY. BRERICK L. BENITO
NOTARY PUBLIC for the Province of Cotabato
Until December 31, 2026
Notarial Commission No. 01-2025
PTR No. 4575824/01-07-25/ Amas, Kidapawan City
IBP Lifetime No. 341733/12-09-20/North Cotabato Chapter
Roll No. 46756

I.4. The conduct of extension projects and activities is sustainable.

University of Southern Mindanao – Extension Services Office Extension Projects

2026 2025 2024 2023 2022

Year 2023

Knowledge and Skills Advancement for the Ambulant Food Vendors in Kabacan, Cotabato
CHEFS
Project Leader: Melchie G. Palapar
Component Leaders: Maribelle T. Piamonte, Shirl Mae M. Bebit
Budget: 60,000

Transferring and Advancing Learning Materials for Knowledge: Using of IECs for Archiving and Information Disseminating (TALK:AID)

ESO
Project Leader: Charlotte Andrea D. Tutor
Component Leaders: Allan C. Facurib, Janice M. Bangoy
Budget: 60,000

Bio-nihan Para sa Kalikasan: Community Empowerment Towards Conservation
CSM
Project Leader: Florence Roy P. Salvaña
Component Leaders: Cromwel M. Jumao-as, Cherie C. Mangaoang
Budget: 60,000

Livelihood Enhancement through Agricultural Products
PALMA
Project Leader: Leo M. Gayao
Component Leaders: Jane R. Desamito, Karizza Jane B. Pejaner, Sambay P. Mila
Budget: 60,000

Use of ICT in Facilitating Independent Learning and Teaching in the New Normal
Graduate School
Project Leader: Benedict D. Entera
Component Leader: Astrofil Hyde M. Alcala
Budget: 60,000

Adopt a Madrasah for Knowledge and Skills Development in Teaching Pedagogy of Azatidz in Barangay Aringay, Kabacan, Cotabato
IMEAS
Project Leader: Sofia G. Molao
Component Leaders: Remedios C. Kulidtod, Norjaida D. Maliga, Jikiri M. Entol, Abdulnasser G. Makalugi
Budget: 60,000

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

Strengthening Mother Tounge-Based Education of Elementary Teachers in DepEd Cotabato/MBHTE BARMM through Instruction Materials Development and Validation
Graduate School
Project Leader: Philip Lester P. Benjamin
Component Leader: Sandra A. Nanding
Budget: 60,000

A Farmer-Centric Study to Evaluate the Adoption and Impact of Transferred Macropropagation Techniques on Cardava Production in Columbio, Sultan Kudarat
ESO
Project Leader: Janice M. Bangoy
Component Leaders: Mary Joy S. Canolas, Charlotte Andrea Tutor
Budget: 60,000

Integrated Services for Enhanced Education (I-SEE): Connectivity Resilience Project Amidst COVID-19 Pandemic
ESO
Project Leader: Janice M. Bangoy
Component Leaders: Brex Brayan Nicolas, Myrna R. Tan, Jovelyn F. Gesulga
Budget: 200,000

Production, Processing, and Positioning (3Ps) Coco-based Products for Collaborative Barangay-based Development and Economic Mainstreaming (3Ps CBDEM)
CBDEM
Project Leader: Jay-R G. Vildac
Component Leaders: Lian D. Bagonoc, Jeannie U. Duka, Aileen Mitzi M. Alba, Rodelyn A. Cariaga
Budget: 100,000

CASAMA- Comprehensive Assistance and Services Authentic and Meaningful Action-Phase
CSM

Project Leader: Cherie C. Mangaoang
Component Leader: Marivic D. Candari
Budget: 100,000

Farmers Field School (FFS): Technology Delivery System for Enhancing Skills on Swine Production and Artificial Insemination
CVM
Project Leader: AP Warren P. Adamat
Component Leader: Vrenelle II D. Flores
Budget: 100,000

CA-CARE: Capacity and Resiliency Enhancement for Agricultural Technologist of Cotabato Province
CA
Project Leader: Noe S. Mamon, Jr.
Component Leader: Gelyn V. Amilbahar
Budget: 100,000

YES, through SSTAMP: Youth Engagement in Sports through Sustainable Sport Training and Management Program
ISPEAR
Project Leader: Elpedio A. Arias
Component Leaders: Moreno P. Java Jr., Vinus P. Java, Eduard S. Sumera
Budget: 148,000

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

Year 2025

Collaborative Networking and Engagement for Community Transformation (CONNECT)
Project Leader: Ritchel O. Torres
Budget: 400,000

Student Registration Management and Library Services for Carmen Senior High School: System Deployment and Resource Enhancement
Project Leader: Jassen Fe C. Calaoagan
Budget: 50,000

BIO-NIHAN PARA SA KALIKASAN: Sustainable Initiatives for Biodiversity Conservation Phase II
Project Leader: Cherie Cano-Mangaoang
Budget: 60,000

"PLANT TO LEARN: Establishment of Vegetable, Herbs, Spices and Medicinal Plants; and Forage Garden at Nangaan High-School"
Project Leader: Monaira E. Sumael
Budget: 50,000

UNIK 2025: The Kasunayan Program
Budget: 360, 000

- **Empowering Indigenous Voices: Building a Sustainable Community Through Local Initiatives**
  Project Leader: Anamarie B. Uyanguren

- **Promoting Healthy Habitats: Empowering the Community Through Health and Environment Initiatives**
  Project Leader: Vinus P. Java
- **Crafting the Future: Protecting Heritage by Promoting Locally-made Products**
  Project Leader: Analyn A. Gonzales
- **Shaping a Sustainable Future: Exploring Local Resources to Fostering Community Sustainability Through Literacy and Education**
  Project Leader: Ellen Joy M. Farala
- **Effective Monitoring and Evaluation for Sustainable Extension Project Outcomes**
  Project Leader: Glyn B. Gabano-Magbanua

CBDEM Delicacies: Capacity-Building, Demonstration and Enterprise Development of Maguindanaon Delicacies
Project Leader: Analyn A. Gonzales
Budget: 60,000

Strengthening Barangay High Schools: Validating and Implementing Representation Approach-Based Learning Materials for Independent Study of Mathematics in Remote Schools
Project Leader: Leorence C. Tandog
Budget: 60,000

Level-Up
Project Leader: Romiel John Basan
Budget: 50,000

Community Action and Rural Bonding Services (CARBonS Advancing Sustainable Livelihood Through Virgin Coconut Oil (VCO) and VCO Based Products
Project Leader: Marivic B. Candari
Budget: 70,000

Skills and Livelihood Training in District Jail in Kabacan, Cotabato
Project Leader: Julbasar M. Sajiran

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

2026 Extension Phase 2

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

WORK PLAN SCHEDULE

PROJECT TITLE:	**Strengthening Barangay Schools (Phase 2): Sustaining Mathematics Learning through Teacher Mentoring and Weekly Student Learning Support**						
COLLEGE/ DEPARTMENT/ UNIT:	CSM/Math & Stat Dept. in collaboration with GS/MST and PhD Ed Math Programs						
PROPONENT (S):	Philip Lester P. Benjamin, Leorence C. Tandog, Sandra A. Nanding						
Total Duration (in months)	12 months	**Planned Start**	April 2026		**Planned End**	March 2027	
Activities	**Expected Outputs**	**Responsible Person**	**Schedule of Activities** 1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	**Milestone (%)**
1. Building Teachers' Capacity through Continuous Mentoring in Mathematics Instruction	○ At least 10 mathematics teachers will participate in continuous mentoring activities. ○ At least 50% of participating teachers will demonstrate improved instructional practices in mathematics.	PL Benjamin,L Tandog, R Madio, S Nanding, DM Verzosa, L Paleta					20%
2. Development and Validation of Mathematics Learning Materials	○ At least 10 learning materials developed and validated	L Tandog, R Valenton, J Pilongo, DM Mamon, AJ Garcia					60%
3. Implementation of Mathematics Learning Materials through Weekly Student Learning Sessions	○ At least 12 weekly mathematics learning support sessions will be conducted for students. ○ At least 30 students will participate in the weekly mathematics learning support sessions.	S Nanding, J Macalisang, RJ Macalisang, LJ Yabes, L Tandog, PL Benjamin					100%

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

DETAILED PROPOSAL FOR EXTENSION

A. BASIC INFORMATION	
1. **Project Title**	**Strengthening Barangay Schools (Phase 2): Sustaining Mathematics Learning through Teacher Mentoring and Weekly Student Learning Support**
Component 1	Building Teachers' Capacity through Continuous Mentoring in Mathematics Instruction
Component 2	Development and Validation of Mathematics Learning Materials
Component 3	Implementation of Mathematics Learning Materials through Weekly Student Learning Sessions
2. **Proponent/s** Indicate Name Academic Rank, Office	**Component 1 Leader:** Philip Lester P. Benjamin **Members:** Debbie Marie B. Verzosa, Jupiter G. Pilongo, Leonard M. Paleta, Rowel P. Madio **Component 2 Leader:** Leorence C. Tandog **Members:** Roel S. Valenton, Anna Jean S. Garcia, Daryl Mae C. Marron, Lawton John A. Yabes **Project Leader/Component 3 Leader:** Sandra A. Nanding **Members:** Jead M. Macalisang, Rona Jane P. Macalisang, Jeaneth R. Licaros, Mauricio Magallon Jr Faculty, Math & Stat Dept, College of Science and Mathematics
2.1. **Email Address**	nanandng@usm.edu.ph
2.2. **Contact Number**	09206992337
3. **Lead Unit/College**	**Department of Math & Stat/ College of Science and Mathematics**
3.1. **Collaborating Unit/College**	**USM – Graduate School**
3.2. **Partner Agency**	**DepEd Cotabato**
4. **Thematic Area**	☒ Quality Learning Skills Development and Literacy ☐ Food Security and Poverty Reduction ☐ Social Development, and Strong Institutions ☐ Good Health and Well-being ☐ Preservation of Culture ☐ Innovations in Science, Engineering, and Technology ☐ Environmental Protection, Conservation and Risk Reduction ☐ Sustainable Entrepreneurship and Management
5. **Sustainable Development Goals**	☐ No Poverty ☐ No Hunger ☐ Good Health ☒ Quality Education

USM-EXT-Proj-Rev 4 2024.09.02

Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Tel No. 63 (64) 572 - 2138
email address: op@usm.edu.ph
OFFICE OF THE PRESIDENT

Special Order No. 2907H
Series of 2026

TO: PROF. SANDRA A. NANDING

SUBJECT: **Designation as PROJECT LEADER/ COMPONENT LEADER 3 with a study entitled: "Strengthening Barangay Schools (Phase II): Sustaining Mathematics Learning through Teacher Mentoring and Weekly Student Learning Support"**

DATE: **Wednesday, 12 August 2026**

In the exigency of the service and pursuant to the policy of harnessing the capabilities of faculty member/employee in managing the affairs of the University, you are hereby designated as **PROJECT LEADER/ COMPONENT LEADER 3 with a study entitled: "Strengthening Barangay Schools (Phase II): Sustaining Mathematics Learning through Teacher Mentoring and Weekly Student Learning Support"** being implemented by the University of Southern Mindanao, in addition to your appointive position.

As such, you are expected to perform the following functions as follows;

1. Prepare Deatiled Proposal, Work Plan Schedule, all other required documents and reports relevant to the conduct of the project;
2. Ensure the timely conduct of pre-implementation activities;
3. Ensure the timely conduct of all activities identified and indicated in the proposal;
4. Coordinate with the ESO and the partner community in the conduct of the activities;
5. Prepare and submit progress reports and documentation;
6. Make oral presentation during the Midyear and Yearend In-house Review;
7. Submit Terminal Report/ Publishable Paper before the end of the year;
8. Ensure quality of extension deliverables and adeherence to specified standards;
9. Ensure efficient utilization of funds; and
10. Attend all regular and emergency meetings as required by the ESO or the Program Leader.

This designation shall take effect on **April 06, 2026 until May 06, 2027** unless otherwise revoked by the undersigned or by a competent authority. All issuances inconsistent with any provisions hereof are deemed revoked, amended or superseded.

JONALD L. PIMENTEL, PhD.
SUC President IV

By Authority of the President:

NERISSA C. DELA VIÑA, PhD.
HRMDO Director

Conforme:

Copy Furnished
___ records
___ HRMDO/201 file
___ File
___ COA file
___ Board Secretary

I.5. Technologies/new knowledge are disseminated to the target clientele through appropriate extension delivery systems.

❖ Training Workshops/ Capacity building

1. Program of Activity

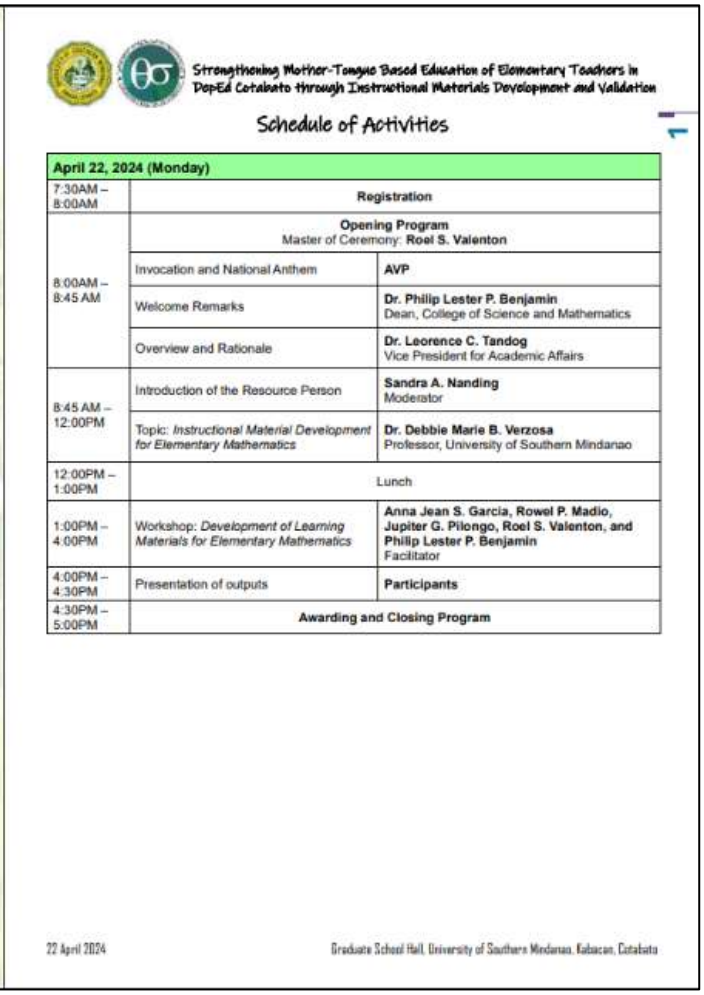


University of Southern Mindanao
College of Science and Mathematics
Department of Mathematics and Statistics

Seminar-Workshop on

Strengthening Mother-Tongue Based Education of Elementary Teachers in DepEd Cotabato through Instructional Materials Development and Validation

April 22, 2024 | Monday | 7:30 AM
Graduate School, University of Southern Mindanao,
Kabacan, Cotabato



Strengthening Mother-Tongue Based Education of Elementary Teachers in DepEd Cotabato through Instructional Materials Development and Validation

Schedule of Activities

April 22, 2024 (Monday)		
7:30AM – 8:00AM	**Registration**	
8:00AM – 8:45 AM	**Opening Program** Master of Ceremony: **Roel S. Valenton**	
	Invocation and National Anthem	**AVP**
	Welcome Remarks	**Dr. Philip Lester P. Benjamin** Dean, College of Science and Mathematics
	Overview and Rationale	**Dr. Leorence C. Tandog** Vice President for Academic Affairs
8:45 AM – 12:00PM	Introduction of the Resource Person	**Sandra A. Nanding** Moderator
	Topic: *Instructional Material Development for Elementary Mathematics*	**Dr. Debbie Marie B. Verzosa** Professor, University of Southern Mindanao
12:00PM – 1:00PM	Lunch	
1:00PM – 4:00PM	Workshop: *Development of Learning Materials for Elementary Mathematics*	**Anna Jean S. Garcia, Rowel P. Madio, Jupiter G. Pilongo, Roel S. Valenton, and Philip Lester P. Benjamin** Facilitator
4:00PM – 4:30PM	Presentation of outputs	**Participants**
4:30PM – 5:00PM	**Awarding and Closing Program**	

22 April 2024 Graduate School Hall, University of Southern Mindanao, Kabacan, Cotabato

2. Training-workshop conducted





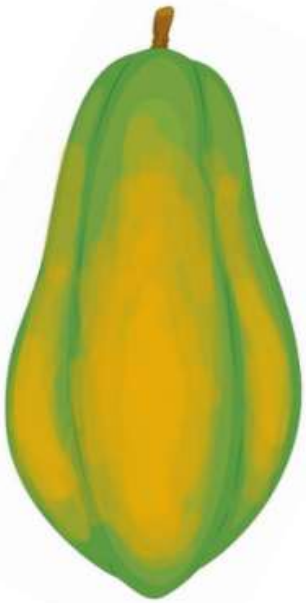
3. IM Developed

Name:_____
Edad:_____
Birthday:_____
School:_____
Grade Level:_____



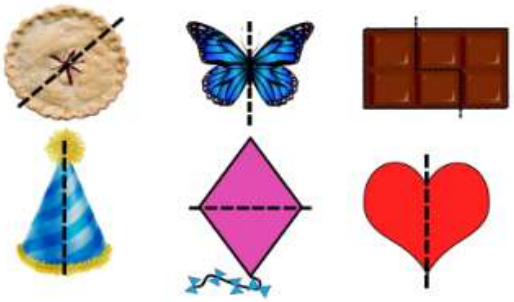
Gawin Natin 'to

Hatiin sa dalawang pantay na bahagi itong papaya.



Suriin Natin 'to

Pantay na Pagkahati sa Dalawa

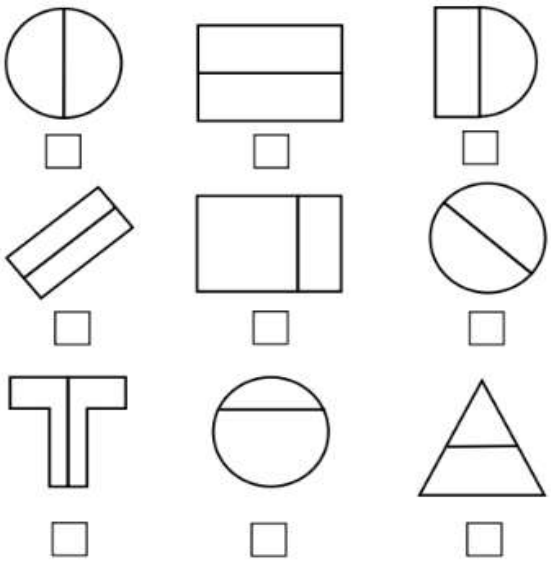


Hindi Pantay na Pagkahati sa Dalawa



Gawin Natin 'to

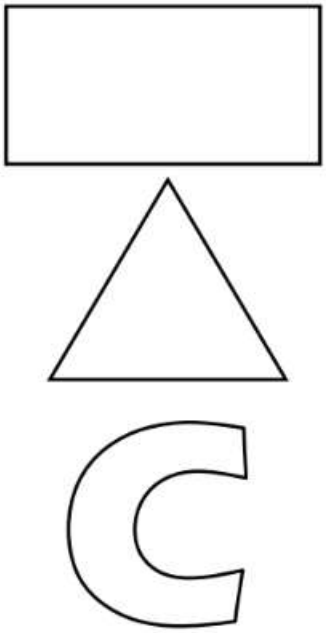
Lagyan ng ☑ ang mga nagpapakita ng pantay na pagkakahati at ✕ ang mga hindi nagpapakita ng pantay na pagkakahati.



PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

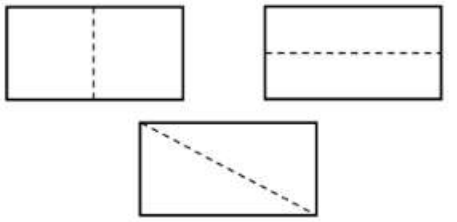
Gawin Natin 'to

Hatiin sa dalawang pantay na bahagi ang mga sumusunod:



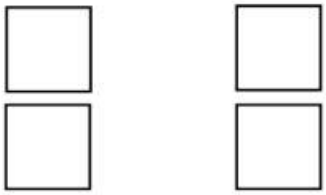
Suriin Natin 'to

Maraming paraan para hatiin sa pantay na bahagi ang isang parihaba o rectangle. Ang mga sumusunod ay ilang mga halimbawa:



Gawin Natin 'to

Hatiin sa dalawang pantay na bahagi ang bawat parisukat. Magbigay ng iba't- ibang klase ng pagkahati.



4. Resource Speaker



Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato

CERTIFICATE

OF RECOGNITION

is awarded to

Debbie Marie B. Verzosa

For sharing her valuable knowledge and expertise as a **Resource Person** during the **"Seminar-workshop on Strengthening Mother-Tongue Based Education of Elementary Teachers in DepEd Cotabato through Instructional Materials Development and Validation"** held on April 22, 2024, at the Graduate School, University of Southern Mindanao, Kabacan, Cotabato.

MARY JOY S. CANOLAS, PHD
Director, Extension Services Office

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

5. IM Implementation



6. Attendance Sheet

University of Southern Mindanao
EXTENSION SERVICES CENTER
Kabacan, Cotabato

ATTENDANCE SHEET

ACTIVITY: strengthening mother-tongue based education of elementary teachers in select contents through instructional materials development and validation

VENUE: GS Hall, USM DATE: APRIL 23, 2024

SPONSORS:

No.	Name	Gender	Designation/ Affiliation	Office/ Unit/ Organization	Mobile Number/ Email Address	Signature
1.	Jennifer R - PAMA	F	ASSO PROF V/DM	Dept of Math, USM	USM 095/253 9100	
2.	Sandra A. Nanding	F		Dept of Math/CSM	09206692397	
3.	Rizel N. Fernano	M	BEDM - Student	Dept. of CBDEM /ETD	09634[illegible]	
4.	Jeziel C. Dorego	F	BEDM Student	Dept. of CBDEM/ETD	0994 373 4388	
5.	Sangkira M. Abdullah	F	BEDM Student	CBDEM/ETD	09463[illegible]	
6.	Langkan, Princess M.	F	BEDM Student	Dept. of CBDEM /ETD	09381[illegible]5655	
7.	PAVIA, LEONARDO M.	M	MATH-CSM-USM			
8.	RUEL S. VALENTON	M	Math - Csm - usm	Math & Stat Dept	09497725[illegible]05	
9.	Dorie Mae Hamm	F	Math	Math	09[illegible]6325[illegible]	
10.	Fatima M. Afdal	F	Teacher - I	MBHTE - BARMM	09[illegible]549[illegible]	
11.	Ramona P. Tacuyan	F	Teacher - I	MBHTE - BARMM	09752[illegible]8[illegible]	
12.	Bhai P. Magunto	F	Teacher - I	MBHTE - BARMM	09161[illegible]019	
13.	Bainuddine C. Sulaiman	M	Teacher - I	MBHTE - BARMM	09064857998	
14.	Muhaimin M. Datumanong	F	T-III	MBHTE - BARMM	09855[illegible]3998	
15.	Mona L. Aron	F	T-I	MBHTE - BARMM	09[illegible]5[illegible]6	

CERTIFIED TRUE COPY:
MARGIE N. MATUAN-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date:

USM-EXT-F02-Rev.3.2021.01.26

No.	Name	Gender	Designation/ Affiliation	Office/ Unit/ Organization	Mobile Number/ Email Address	Signature
16.	MIVIDA ANGELA M. ELIVAS	F	T-I	MBHTE - BARMM	09[illegible]7[illegible]4547	
17.	JOHARIMAE P. TOMANGAS	F	T-I	MBHTE - BARMM	09[illegible]4[illegible]747	
18.	ROSHAIMA W. KARUNDA	F	T-I	MBHTE - BARMM	09[illegible]8[illegible]	
19.	SARAH JEAN A. SALIPUDIN	F	T-III/TC	MBHTE - BARMM	09[illegible]4[illegible]	
20.	AMELAIDA B. VASAY	F	T-I	MBHTE - BARMM	09[illegible]5[illegible]4	
21.	JENNIFER R. LOANOS	F	Assoc Prof	Math & Stat Dept./CSM	09120[illegible]356	
22.	ANNA JEAN S. GARCIA	F	Assoc Prof	Math & Stat Dept/CSM	09[illegible]2[illegible]2468	
23.	JOHARIMAE WAY M. GANI	F	DM	CBDEM/ETD	09977[illegible]7[illegible]2	
24.	Lawrence Tangkay	M	Prof VI	GS/CSM		
25.	Jonald L. Pimentel	M	Prof VI	Math & Stat		
26.	MARGRICHS J. AMACLOON JR	M	Assoc Prof I	Math & Stat		
27.	Sarah B. Lumanlan					
28.	FRANCE D. TOLOSA			MATH & STAT DEPT		
29.	ROLO MABIL	M	Assoc Prof 4	Math & Stat		
30.	PROF ESTHER MANDIGMA	F	Assoc Prof 5	Math and Stat		

CERTIFIED TRUE COPY:
MARGIE N. MATUAN-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date:

USM-EXT-F02-Rev.3.2021.01.26

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

1. Program of Activities



PROGRAM

SEMINAR-WORKSHOP ON EMPOWERING EDUCATORS: CRAFTING LEARNING MATERIALS AND IMPLEMENTING DESIGN-BASED ACTION RESEARCH

Venue: Graduate School, University of Southern Mindanao, Kabacan, Cotabato

Date: May 30-31, 2025

This serves as an invitation

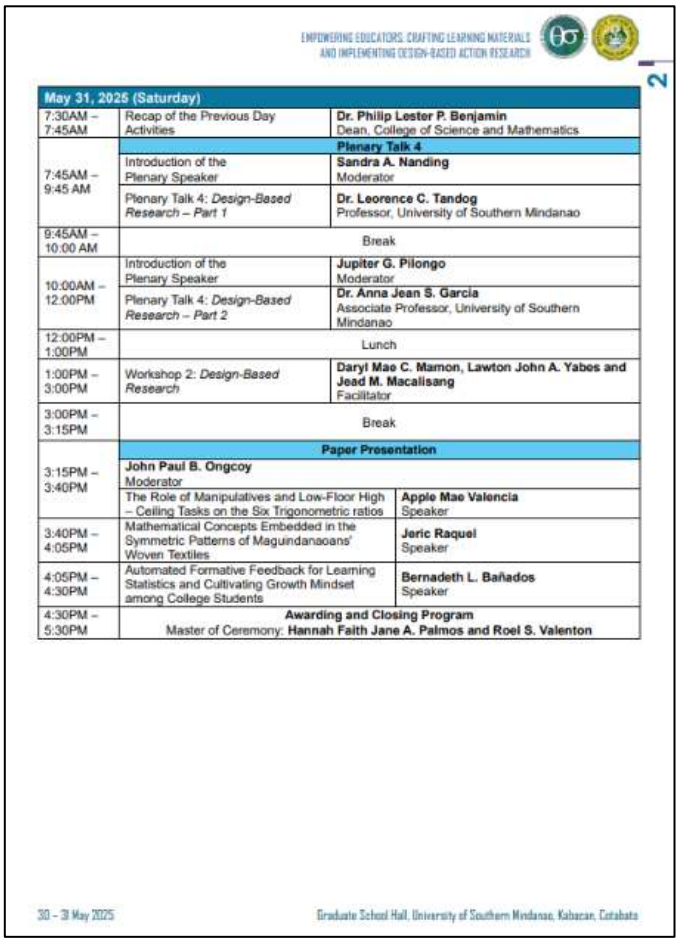
EMPOWERING EDUCATORS: CRAFTING LEARNING MATERIALS AND IMPLEMENTING DESIGN-BASED ACTION RESEARCH

1

Schedule of Activities

May 30, 2025 (Friday)		
6:30AM – 7:15AM	Registration	
7:15AM – 7:45 AM	Opening Program Master of Ceremony: **Hannah Faith Jane A. Palmos and Roel S. Valenton**	
	Invocation and National Anthem	**AVP**
	Welcome Remarks	**Dr. Philip Lester P. Benjamin** Dean, College of Science and Mathematics
	Overview and Rationale	**Dr. Leorence C. Tandog** Vice President for Academic Affairs
7:45AM – 9:45 AM	**Plenary Talk 1**	
	Introduction of the Plenary Speaker	**Roel S. Valenton** Moderator
	Plenary Talk 1: *Action Research*	**Ms. Aurea Puyos** Senior Instructor, Notre Dame of Kidapawan College
9:45AM – 10:00 AM	Break	
10:00AM – 12:00 PM	**Plenary Talk 2**	
	Introduction of the Plenary Speaker	**Rowel P. Madio** Moderator
	Plenary Talk 2: *Writing Good Math Problems*	**Dr. Ian June L. Garces** Associate Professor, Ateneo de Manila
12:00PM – 1:00PM	Lunch	
1:00PM – 2:00PM	**Plenary Talk 3**	
	Introduction of the Plenary Speaker	**Leonard M. Paleta** Moderator
	Plenary Talk 3: *Development of Representation Approach - Learning Materials*	**Dr. Debbie Marie B. Verzosa** Professor, University of Southern Mindanao
2:00PM – 2:15PM	Break	
2:15PM – 4:15PM	Workshop 1: *Development of Learning Mateirals*	**Sandra A. Nanding, Watarie E. Manto, and Leif Cullin A. Matandog** Facilitator
4:15PM – 4:40PM	**Paper Presentation**	
	Fitzmee Ann D. Tamulak Moderator	
	Bridging Ethnomathematical Practices of Obo Manobo Tahiti Farmers and Mathematics Education (Phase 2): Designing Mathematical Problem and Exploring Teachers' Perception	**Wrendell Juntilla** Speaker
4:40PM – 5:05PM	The Application of Enhanced Damath in Learning Operations on Integers and Developing Strategic Thinking	**Cherrylee Buhay** Speaker
5:05PM – 5:30PM	The Effect of PowToon to the Proficiency Level in General Mathematics of Grade 11 Students in Bacongco National High School	**Elaine Grace H. Adto** Speaker

30 – 31 May 2025 Graduate School Hall, University of Southern Mindanao, Kabacan, Cotabato



EMPOWERING EDUCATORS: CRAFTING LEARNING MATERIALS AND IMPLEMENTING DESIGN-BASED ACTION RESEARCH

2

May 31, 2025 (Saturday)		
7:30AM – 7:45AM	Recap of the Previous Day Activities	**Dr. Philip Lester P. Benjamin** Dean, College of Science and Mathematics
7:45AM – 9:45 AM	**Plenary Talk 4**	
	Introduction of the Plenary Speaker	**Sandra A. Nanding** Moderator
	Plenary Talk 4: *Design-Based Research – Part 1*	**Dr. Leorence C. Tandog** Professor, University of Southern Mindanao
9:45AM – 10:00 AM	Break	
10:00AM – 12:00PM	Introduction of the Plenary Speaker	**Jupiter G. Pilongo** Moderator
	Plenary Talk 4: *Design-Based Research – Part 2*	**Dr. Anna Jean S. Garcia** Associate Professor, University of Southern Mindanao
12:00PM – 1:00PM	Lunch	
1:00PM – 3:00PM	Workshop 2: *Design-Based Research*	**Daryl Mae C. Mamon, Lawton John A. Yabes and Jead M. Macalisang** Facilitator
3:00PM – 3:15PM	Break	
3:15PM – 3:40PM	**Paper Presentation**	
	John Paul B. Ongcoy Moderator	
	The Role of Manipulatives and Low-Floor High – Ceiling Tasks on the Six Trigonometric ratios	**Apple Mae Valencia** Speaker
3:40PM – 4:05PM	Mathematical Concepts Embedded in the Symmetric Patterns of Maguindanaoans' Woven Textiles	**Jeric Raquel** Speaker
4:05PM – 4:30PM	Automated Formative Feedback for Learning Statistics and Cultivating Growth Mindset among College Students	**Bernadeth L. Bañados** Speaker
4:30PM – 5:30PM	**Awarding and Closing Program** Master of Ceremony: **Hannah Faith Jane A. Palmos and Roel S. Valenton**	

30 – 31 May 2025 Graduate School Hall, University of Southern Mindanao, Kabacan, Cotabato

2. Training-workshop conducted









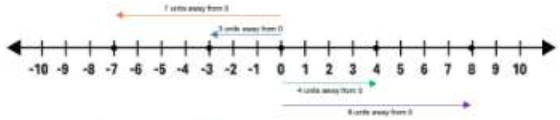
PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

3. IM Developed

Absolute Value – How Far from Zero?
By: Elma Mae R. Donato, Phd Ed-Math 1

Learning Objectives:
- Identify absolute value as distance from zero on a number line
- Represent absolute value in multiple ways
- Connect absolute value to real-world situations

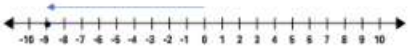
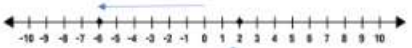
PART 1: Visual Representation – Number Line Distance



From the illustration above, we can deduce the following:

Number	Distance from 0	Absolute Value
–7	_____ units	|-7| = 7
–3	3 units	|-3| = ____
4	_____ units	|4| = 4
6	6 units	|6| = _____

PART 2: Symbolic (Algebraic) Representation
Directions: Write and evaluate the absolute value of the following expressions

1. |−9|=___ 
2. _____ 
3. |-3 + ___| = 4 
4. |−6|+|2|=___ 
5. _____ = 10 

Challenge:
1. |−4−6|=_____ 2. |−3|•|−2|=_____

PART 3: Verbal Representation
Directions: Explain in words
1. How would you describe an absolute value of a number?
2. Which numbers have an absolute value of 2? How do you know?
3. How can you explain why the absolute value of 0 is 0??

PART 4: Contextual Representation – Real-Life Scenarios
Directions: Read the situations and write an absolute value equation.
1. A diver descends 15 meters below sea level.
   What is the absolute value of the diver's elevation?
   |−15|=15 ⟶ |x|=15 where x represents the diver's elevation relative to sea level
2. The temperature dropped from 5°C to –8°C overnight.
   What is the absolute value of the temperature change?
3. You owe ₱25,000.
   What's the absolute value of your debt?
4. Maria walked 3 blocks west and then 4 blocks east of her starting point.
   What is her total distance from the origin, and what is the absolute value of her final position?
5. In a basketball game, Team A scored 78 points, and Team B scored 65 points.
   What is the absolute value of the point difference between the two teams?

Part 5: Reflection
1. Why do we use absolute value when measuring distance?
2. Can the absolute value of a number ever be negative?
3. How does absolute value help make sense of negative numbers in real life?

UNIVERSITY OF SOUTHERN MINDANAO
GRADUATE SCHOOL
Kabacan, Cotabato

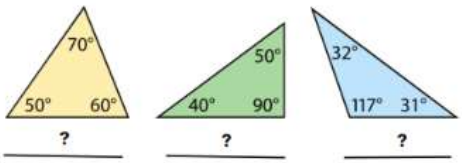
TRIANGLE TRIGONOMETRY
SAMPLE WORKSHEET

Objective:

Solve problems involving oblique triangles using law of sines and cosines. (M9GE- IVh-j-1)

Activity 1-A: **Name It!**

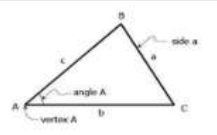
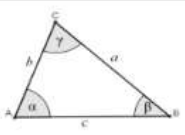
Identify whether the figures are oblique triangles or not.



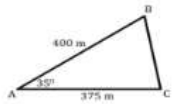
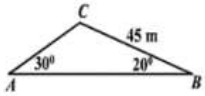
? ? ?

Activity 1: **Gotcha!**

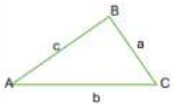
A. Fill in the missing by identifying the opposite side/s or opposite angle/s of the given triangle.

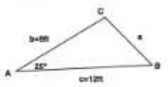
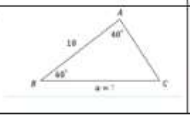
1.)	2.)
	
• side ___ is opposite angle 'A'. • side b is opposite angle _____. • side _____ is opposite angle 'C'.	• side __ is opposite angle 'A". • side b is opposite angle _____. • side _____ is opposite angle _____.

B. Count the number of angle/s and side/s of the triangle then indicate whether to use Law of Sines/Cosines to find the missing on the triangle.

	
• no. of angle/s given: _____ • no. of side/s given: _____ • Law of _____	• no. of angle/s given: _____ • no. of side/s given: _____ • Law of _____

C. Determine the formulas for law of sines /law of cosines that can be used to find the missing in the given triangle.

Figure	Law of Sines	Law of Cosines
	✓ $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$ or ✓ $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$	✓ $a^2 = b^2 + c^2 - 2bc\cos A$ ✓ $b^2 = a^2 + c^2 - 2ac\cos B$ ✓ $c^2 = a^2 + b^2 - 2ab\cos C$

Figures	Possible formula that can be used:
1.) Find the missing angles and sides. 	Law of Cosine:
2.) Solve for a. 	Law of Sine:

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

DEVELOPMENTAL ACTIVITY SHEET

(Rossianee A. Estestes, Maricel E. Gindap, Emacil A. Bomea)

Level 1. Understanding the Role of Order in Permutation and Combination

Activity 1: Order or No order?

Directions: Look at each picture. Decide if order matters or not.
Write **P** for Permutation (**order**) or **C** for Combination (**no order**) next to each picture.

Picture	Order or No Order	Permutation or Combination
1. Halo-halo 	*No Order*	*C*
2. Alphabets 	*Order*	*P*
3. Picking the 1st, 2nd, and 3rd winners 		
4. Classroom officers 		
5. Selecting team 		
6. Selection of food 		
7. Assembling a jigsaw puzzle 		
8. Entering the PIN of your ATM card 		
9. Plate number NBC 1234		
10. Selection of clothes 		

Level 2. Classify and Represent Permutations and Combinations

Activity 2. P or C: Spot the rule!

Instructions: Read each situation. Decide whether it is a **permutation (P)** or **combination (C)**. Then, write the correct expression using P(n,r) or C(n,r).

Note:
Permutation= ${}_nP_r$ or P(n,r)
Combination = ${}_nC_r$ or C(n,r)

where: n= number of objects in set, r= number of chosen objects in set

GIVEN	SOLUTIONS
1. Choosing 2 leaders (president and vice president) from 6 students.	Permutation → P(6,2)
2. Selecting 3 students to join a club from 10 applicants.	Combination → C(10,3)
3. Forming a 4-digit code from the numbers 0–9 with no repetition.	
4. Picking 2 ice cream flavors out of 7 available options.	
5. Selecting 5 winners from 20 raffle entries (all winners are equal).	
6. A coach selects 6 players out of 15 to join the basketball team. The position they play does not matter yet.	
7. A school wants to assign 4 different project topics to 4 out of 10 students.	
8. Choosing 4 questions to answer out of 10 optional questions on an exam.	
9. You need to select and arrange 5 out of 12 artworks for a gallery display in a specific order.	
10. A password is created using 4 letters (no repeats) from the 26-letter alphabet.	

4. IM Implementation






PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

5. Resource Speaker



Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato

CERTIFICATE

OF RECOGNITION

is awarded to

Anna Jean S. Garcia

For sharing her valuable knowledge and expertise as a **Resource Person** during the **"Seminar-workshop on Empowering Educators: Crafting Learning Materials and Implementing Design-Based Action Research"** held on May 30 - 31, 2025, at the Graduate School, University of Southern Mindanao, Kabacan, Cotabato.

GLYN B. GADANO– MAGBANUA, PhD
Director, Extension Services Office



Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato

CERTIFICATE

OF RECOGNITION

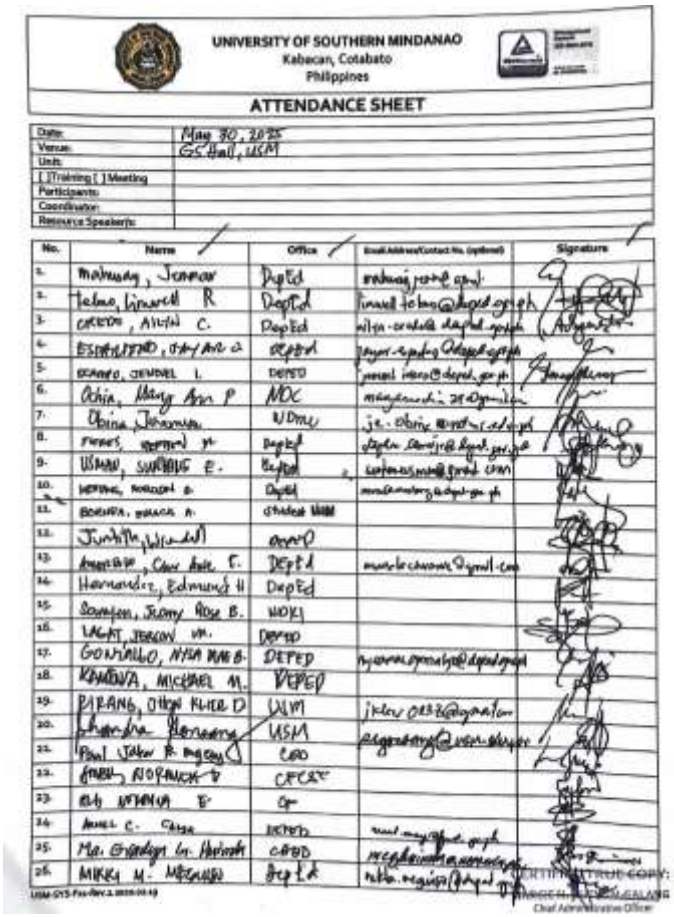
is awarded to

Debbie Marie B. Verzosa

For sharing her valuable knowledge and expertise as a **Resource Person** during the **"Seminar-workshop on Empowering Educators: Crafting Learning Materials and Implementing Design-Based Action Research"** held on May 30 - 31, 2025, at the Graduate School, University of Southern Mindanao, Kabacan, Cotabato.

GLYN B. GADANO– MAGBANUA, PhD
Director, Extension Services Office

6. Attendance Sheet

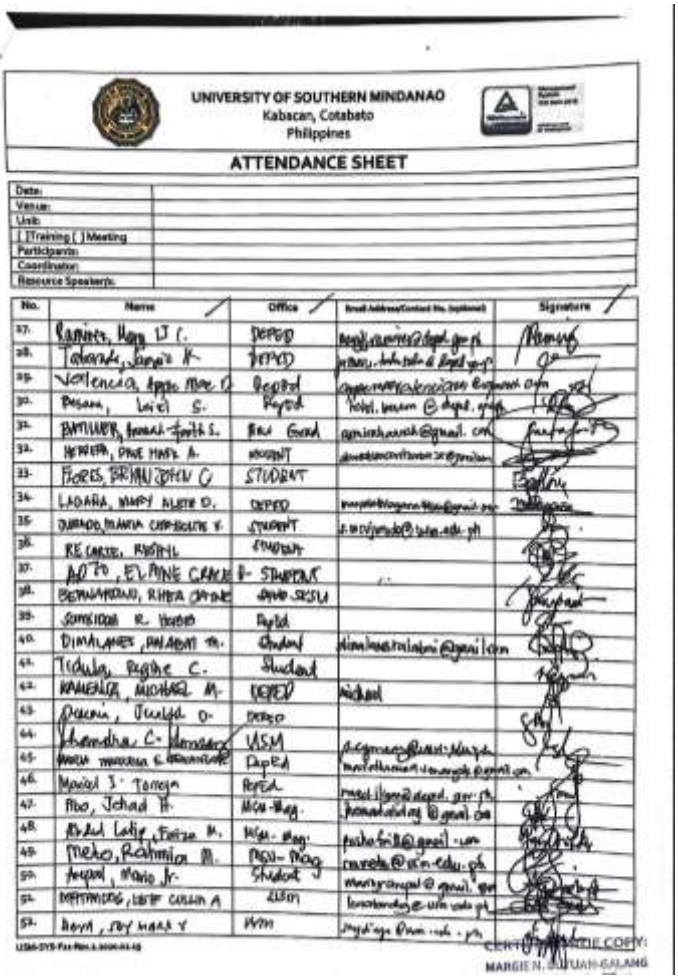


UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

ATTENDANCE SHEET

Date:	May 30, 2025
Venue:	GS Hall, USM
Unit:	
[ ]Training [ ] Meeting	
Participants:	
Coordinator:	
Resource Speaker/s:	

No.	Name	Office	Email Address/Contact No. (optional)	Signature
1.	Mahinay, Jennifer	DepEd		
2.	Talmo, Linnard R	DepEd		
3.	CAÑEDO, ALVIN C.	DepEd		
4.	ESTABILLO, MARY ANN O.	DEPED		
5.	EDANO, JENNIVEL L.	DEPED		
6.	Ochia, Mary Ann P	MDC		
7.	Obina, Johanna	UDMU		
8.	FLORES, BRYAN JOHN G	DepEd		
9.	USMAN, SUKAINA E.	DepEd		
10.				
11.				
12.				
13.				
14.	Hernandez, Edmund H	DepEd		
15.	Sompon, Jhamy Rose B.	MDKI		
16.	LAGAT, JERSON M.	DEPED		
17.	GONZALES, NYSA MAE B.	DEPED		
18.	KAMENTA, MICHAEL M.	DEPED		
19.	PARANG, OTHO KLIEG D	USM		
20.		USM		
21.		CED		
22.		CFCST		
23.				
24.		DEPED		
25.		CBED		
26.		DepEd		



UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

ATTENDANCE SHEET

Date:	
Venue:	
Unit:	
[ ]Training [ ] Meeting	
Participants:	
Coordinator:	
Resource Speaker/s:	

No.	Name	Office	Email Address/Contact No. (optional)	Signature
27.		DEPED		
28.		DEPED		
29.		DepEd		
30.		DepEd		
31.		BEU Guard		
32.		STUDENT		
33.		STUDENT		
34.		DEPED		
35.		STUDENT		
36.		STUDENT		
37.		STUDENT		
38.				
39.		DepEd		
40.		Student		
41.		Student		
42.		DEPED		
43.		DEPED		
44.		USM		
45.		DepEd		
46.		DepEd		
47.		MSU-Mag.		
48.		MSU- Mag.		
49.		MSU- Mag.		
50.		Student		
51.		USM		
52.		MSU		

I.6. The extension activities are documented in the form of:

I.6.1. pamphlets;

I.6.2. flyers;

I.6.3. bulletins;

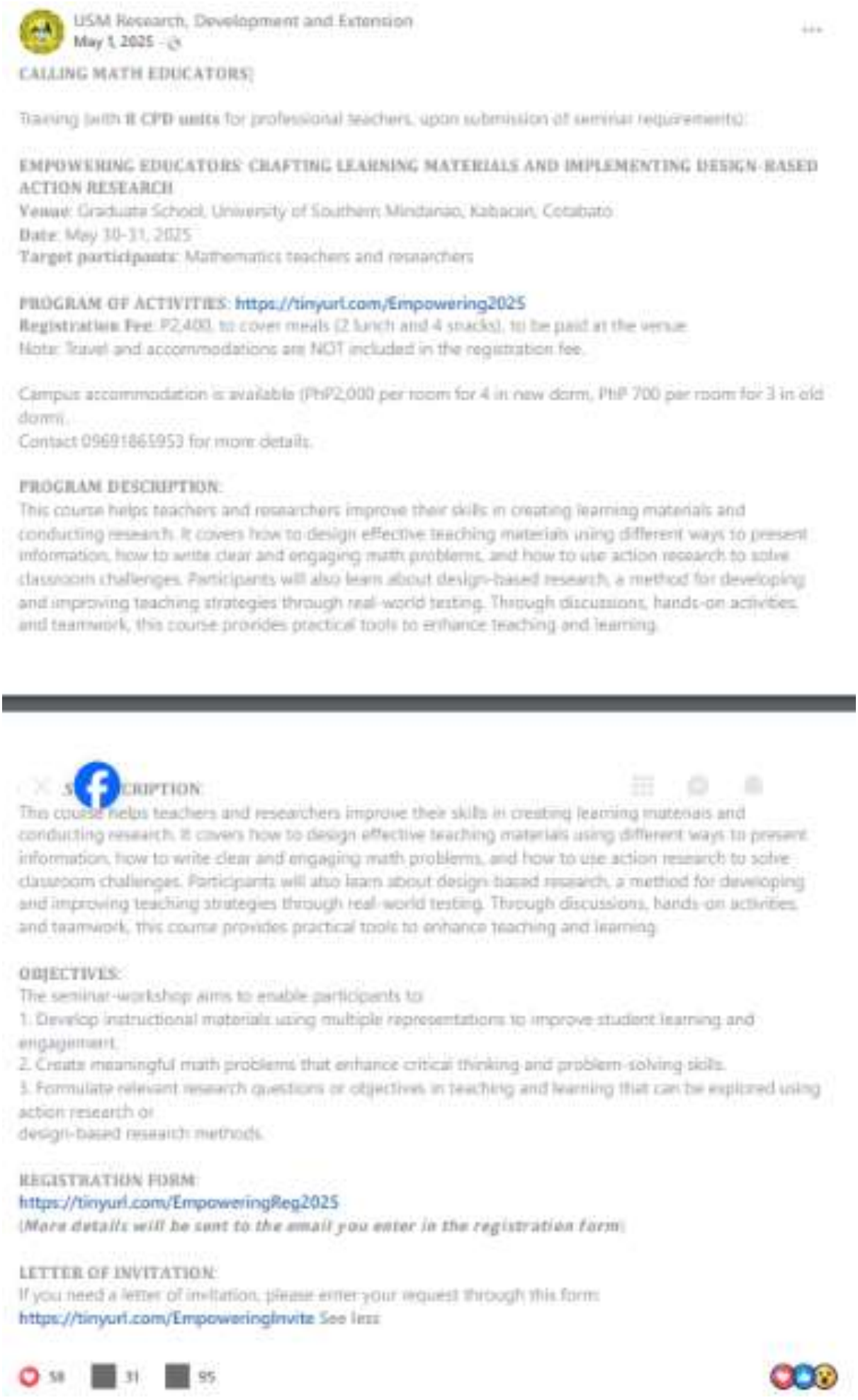
I.6.4. newsletters; and

I.6.5. electronic resources.



fb link: https://web.facebook.com/share/p/1ecWYUPh48/

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION



USM Research, Development and Extension
May 1, 2025 ·

CALLING MATH EDUCATORS!

Training (with 8 CPD units for professional teachers, upon submission of seminar requirements):

EMPOWERING EDUCATORS: CRAFTING LEARNING MATERIALS AND IMPLEMENTING DESIGN-BASED ACTION RESEARCH
Venue: Graduate School, University of Southern Mindanao, Kabacan, Cotabato
Date: May 30-31, 2025
Target participants: Mathematics teachers and researchers

PROGRAM OF ACTIVITIES: https://tinyurl.com/Empowering2025
Registration Fee: P2,400, to cover meals (2 lunch and 4 snacks), to be paid at the venue
Note: Travel and accommodations are NOT included in the registration fee.

Campus accommodation is available (PhP2,000 per room for 4 in new dorm, PhP 700 per room for 3 in old dorm).
Contact 09691865953 for more details.

PROGRAM DESCRIPTION:
This course helps teachers and researchers improve their skills in creating learning materials and conducting research. It covers how to design effective teaching materials using different ways to present information, how to write clear and engaging math problems, and how to use action research to solve classroom challenges. Participants will also learn about design-based research, a method for developing and improving teaching strategies through real-world testing. Through discussions, hands-on activities, and teamwork, this course provides practical tools to enhance teaching and learning.

S CRIPTION:
This course helps teachers and researchers improve their skills in creating learning materials and conducting research. It covers how to design effective teaching materials using different ways to present information, how to write clear and engaging math problems, and how to use action research to solve classroom challenges. Participants will also learn about design-based research, a method for developing and improving teaching strategies through real-world testing. Through discussions, hands-on activities, and teamwork, this course provides practical tools to enhance teaching and learning.

OBJECTIVES:
The seminar-workshop aims to enable participants to:
1. Develop instructional materials using multiple representations to improve student learning and engagement.
2. Create meaningful math problems that enhance critical thinking and problem-solving skills.
3. Formulate relevant research questions or objectives in teaching and learning that can be explored using action research or
design-based research methods.

REGISTRATION FORM:
https://tinyurl.com/EmpoweringReg2025
(More details will be sent to the email you enter in the registration form).

LETTER OF INVITATION:
If you need a letter of invitation, please enter your request through this form:
https://tinyurl.com/EmpoweringInvite See less

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PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

DepEd RXII Salvacion HS
October 10, 2025 ·

Empowering Education Through Research: Dr. Leorence C. Tandog Leads USM Master of Mathematics Students in Conducting Action Research at Salvacion High School

It was indeed a great privilege for Salvacion High School to be chosen as the research site by the Vice President for Academic Affairs of the University of Southern Mindanao (USM), Dr. Leorence Tandog, together with her students majoring in Mathematics.

The purpose of the activity was to conduct an Action Research that aims to address relevant issues and challenges in the field of Mathematics education.

Salvacion High School expressed its heartfelt gratitude to Dr. Tandog and her students for selecting the school as the recipient of the research outputs that will be produced from their study.

The findings and materials developed through this research are expected to benefit both teachers and learners, enhancing instructional strategies and strengthening the quality of Mathematics education within the school.

This partnership embodies the spirit of academic collaboration, community engagement, and continuous professional growth—values shared by both the University of Southern Mindanao and Salvacion High School. Truly, this endeavor serves as a step forward in promoting excellence in education and fostering a culture of research-based improvement in teaching practices. 🏫👍✔ See less



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fb link: https://web.facebook.com/share/p/1EKaaoJJiP/

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

DepEd RXII Salvacion HS
June 1, 2025 ·

Salvacion High School Participated in the Seminar-Workshop on Empowering Educators: Crafting Learning Materials and Design Based Action Research

Salvacion High School faculty and staff headed by Jerson M. Lagat,MT I had the opportunity to participate in a seminar workshop titled "Empowering Educators: Crafting Learning Materials and Design Based Action Research"organized by the College of Science and Mathematics at the University of Southern Mindanao. The event took place at the University Graduate School on May 30-31, 2025. The first day began with Dr. Philip Lester P. Benjamin delivering the opening remarks, setting a positive tone for the workshop. Following this, Dr. Jonald L. Pimentel, the SUC President IV, delivered an inspirational message highlighting the importance of continuous learning and growth in the field of education.

Dr. Leorence C. Tandog then provided an overview of the seminar workshop, outlining the objectives and expectations for the participants. The day's sessions started with a lecture on action research by Ms. Aurea Puyos, a Senior Instructor at the Notre Dame of Kidapawan College. Her insights into the practical application of research methodologies sparked engaging discussions among the attendees. Next, a session on "Writing Good Math Problems (Online Mode)"was lectured by Dr. Ian Jude L. Garces an Associate Professor at Ateneo De Manila University, emphasizing the importance of creating engaging and challenging mathematical problems to enhance students' critical thinking skills.

Dr. Debbie Marie B. Versoza, a respected professor from USM, led a lecture on the "Development of Representation Approach- Learning Materials "showcasing innovative approaches to design

paper presentations, where participants shared their studies and findings, fostering a collaborative learning environment.

The second day of the workshop featured a lecture on Design Based Research by Dr. Leorence C. Tandog, an Associate Professor at USM accompanied by Prof. Anna Jean S. Garcia.Together, they shared strategies and techniques in conducting Design Based research. The day ended in a series of paper presentations, allowing participants to showcase their research projects and receive valuable feedback from their participants.

Overall, the seminar workshop provided a valuable platform for the teachers to enhance their knowledge and skills in developing effective learning materials and conducting action research. Participants left the workshop feeling inspired and equipped with new strategies and techniques to improve their teaching practices and make a positive impact in the field of education.

#DepEdPhilippines See less









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fb link https://web.facebook.com/share/p/1CdEmQzDoR/

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

USM Seminar Highlights Innovation for Educators from Various Institutions

Home › News › USM Seminar Highlights Innovation for Educators from Various Institutions

Published by Charlotte Andrea Tutor at June 4, 2025



The University of Southern Mindanao (USM) hosted its two-day seminar-workshop titled *"Empowering Educators: Crafting Learning Materials and Implementing Design-Based Action Research,"* held on May 30–31, 2025, at the Graduate School, USM, Kabacan, Cotabato.

The event, accredited with 8 CPD (Continuing Professional Development) units, brought together educators from various institutions to enhance their competencies in developing instructional materials and conducting classroom-based research.

In his inspirational message, USM President Dr. Jonald L. Pimentel emphasized the critical role of teachers in shaping quality education. He encouraged participants to continue innovating their teaching practices.







Meanwhile, the workshop focused on three major goals:

1. Developing instructional materials using multiple representations to improve student engagement;
2. Creating meaningful math problems that promote critical thinking and problem-solving;
3. Formulating relevant research questions for action research and design-based methods.

The event featured lectures, presentations, and hands-on workshops facilitated by experts in mathematics education, research, and instructional design. Participants also engaged in peer evaluations and group discussions during the seminar.

Dr. Philip Lester P. Benjamin, the Dean of the College of Science and Mathematics, and the Conference Chairperson, led the initiative and highlighted the importance of building a strong research culture among educators.

Participants expressed appreciation for the seminar, noting its relevance in helping them respond to real challenges in their classrooms. The event concluded with the presentation and recognition of participants' outputs and a reaffirmation of their commitment to continuous professional growth.

USM Website link: https://www.usm.edu.ph/usm-seminar-highlights-innovation-for-educators-from-various-institutions/

I.7. Periodic monitoring and evaluation of extension projects and activities are conducted

2023 Project

University of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

MONITORING/ ACCOMPLISHMENT REPORT

for the 1st Quarter, C.Y. 2023

Project Title: Strengthening Mother-tongue based Education of Elementary Teachers in DepEd Cotabato/MBHTE BARMM through Development and Validation of Instructional Materials for Elementary Mathematics

Proponent/s: Philip Lester Benjamin, Sandra Nanding, Leorence Tandog, Debbie Marie Verzosa, Florie Jane Tamon, Rowel Madio, Roel Valenton, Anna Jean Garcia, Leonard Paleta, Meriam Rubio, Jeaneth Licaros, Daryl Mae Mamon, Jonald Pimentel, Jennifer Pama, Honey Vincent Valle

College/Unit: Graduate School/College of Science and Mathematics | **Budget Utilization to date: (%)**

ACTIVITIES	Accomplishment		% Completion (Cumulative)	Problem/s Encountered	Action/s Taken	Remarks/ Recommendations
	Target	Actual				
Obtain necessary permissions and approvals from relevant authorities	10%	100%	10%	None	None	
Conduct profiling and needs assessment	20%	100%	30%	None	None	

Prepared by:

PHILIP LESTER P. BENJAMIN
Project Leader
April 7, 2023
Date

Noted by:

LEORENCE C. TANDOG
College/Unit Head
April 10, 2023
Date

MARY JOY S. CAÑOLAS
Director for Extension Services
April 10, 2023
Date

USM-EXT-F07-Rev.3.2021.01.26

University of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

MONITORING/ ACCOMPLISHMENT REPORT

for the 2nd Quarter, C.Y. 2023

Project Title: Strengthening Mother-tongue based Education of Elementary Teachers in DepEd Cotabato/MBHTE BARMM through Development and Validation of Instructional Materials for Elementary Mathematics

Proponent/s: Philip Lester Benjamin, Sandra Nanding, Leorence Tandog, Debbie Marie Verzosa, Florie Jane Tamon, Rowel Madio, Roel Valenton, Anna Jean Garcia, Leonard Paleta, Meriam Rubio, Jeaneth Licaros, Daryl Mae Mamon, Jonald Pimentel, Jennifer Pama, Honey Vincent Valle

College/Unit: Graduate School/College of Science and Mathematics | **Budget Utilization to date: (%)**

ACTIVITIES	Accomplishment		% Completion (Cumulative)	Problem/s Encountered	Action/s Taken	Remarks/ Recommendations
	Target	Actual				
% Completion 1st Quarter			30%			
Development and refining of existing IMs	25%	100%	55%	None	None	

Prepared by:

PHILIP LESTER P. BENJAMIN
Project Leader
July 3, 2023
Date

Noted by:

LEORENCE C. TANDOG
College/Unit Head
July 3, 2023
Date

MARY JOY S. CAÑOLAS
Director for Extension Services
July 5, 2023
Date

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

University of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

MONITORING/ ACCOMPLISHMENT REPORT

for the 3rd Quarter, C.Y. 2023

Project Title: Strengthening Mother-tongue based Education of Elementary Teachers in DepEd Cotabato/MBHTE BARMM through Development and Validation of Instructional Materials for Elementary Mathematics

Proponent/s: Philip Lester Benjamin, Sandra Nanding, Leorence Tandog, Debbie Marie Verzosa, Florie Jane Tamon, Rowel Madio, Roel Valenton, Anna Jean Garcia, Leonard Paleta, Meriam Rubio, Jeaneth Licaros, Daryl Mae Mamon, Jonald Pimentel, Jennifer Pama, Honey Vincent Valle

College/Unit: Graduate School/College of Science and Mathematics | **Budget Utilization to date: (%)**

ACTIVITIES	Accomplishment		% Completion (Cumulative)	Problem/s Encountered	Action/s Taken	Remarks/ Recommendations
	Target	Actual				
% Completion 2nd Quarter			55%			
Validation of the instructional materials	25%	0%	55%	Unable to proceed due to scheduling conflict	Identified scheduling conflict and attempted to reschedule	

Prepared by:

PHILIP LESTER P. BENJAMIN
Project Leader
September 11, 2023
Date

Noted by:

LEORENCE C. TANDOG
College/Unit Head
September 11, 2023
Date

MARY JOY S. CAÑOLAS
Director for Extension Services
September 14, 2023
Date

University of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

MONITORING/ ACCOMPLISHMENT REPORT

for the 4th Quarter, C.Y. 2023

Project Title: Strengthening Mother-tongue based Education of Elementary Teachers in DepEd Cotabato/MBHTE BARMM through Development and Validation of Instructional Materials for Elementary Mathematics

Proponent/s: Philip Lester Benjamin, Sandra Nanding, Leorence Tandog, Debbie Marie Verzosa, Florie Jane Tamon, Rowel Madio, Roel Valenton, Anna Jean Garcia, Leonard Paleta, Meriam Rubio, Jeaneth Licaros, Daryl Mae Mamon, Jonald Pimentel, Jennifer Pama, Honey Vincent Valle

College/Unit: Graduate School/College of Science and Mathematics | **Budget Utilization to date: (%)**

ACTIVITIES	Accomplishment		% Completion (Cumulative)	Problem/s Encountered	Action/s Taken	Remarks/ Recommendations
	Target	Actual				
% Completion 3rd Quarter			55%			
Validation of the instructional materials	25%	100%	80%	None	None	
Report Writing	20%	100%	100%	None	None	

Prepared by:

PHILIP LESTER P. BENJAMIN
Project Leader
December 18, 2023
Date

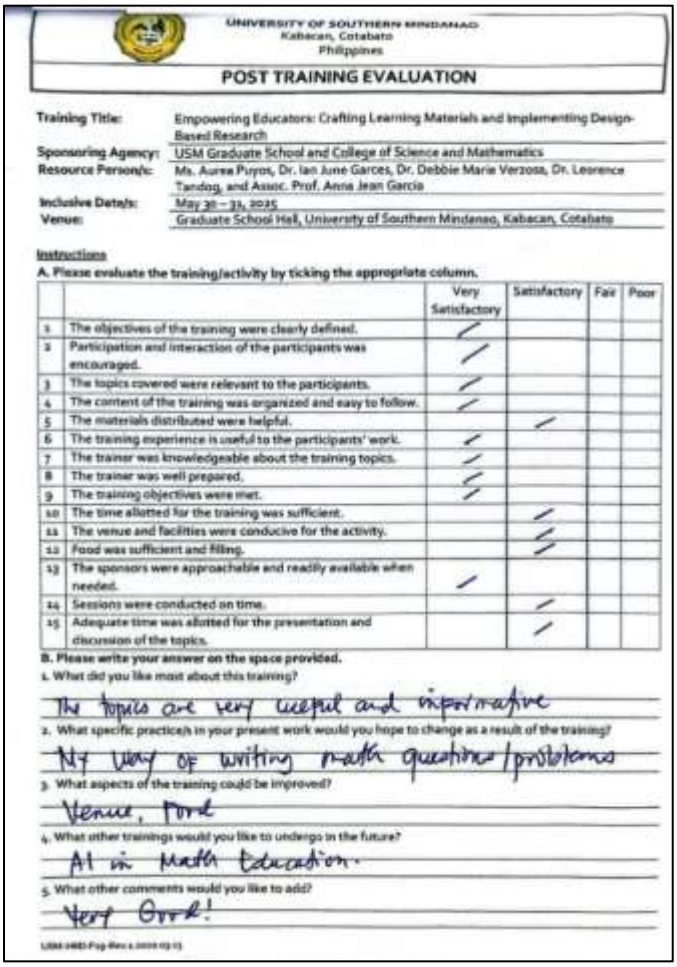
Noted by:

LEORENCE C. TANDOG
College/Unit Head
December 18, 2023
Date

MARY JOY S. CAÑOLAS
Director for Extension Services
December 21, 2023
Date

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

2025 Project



UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

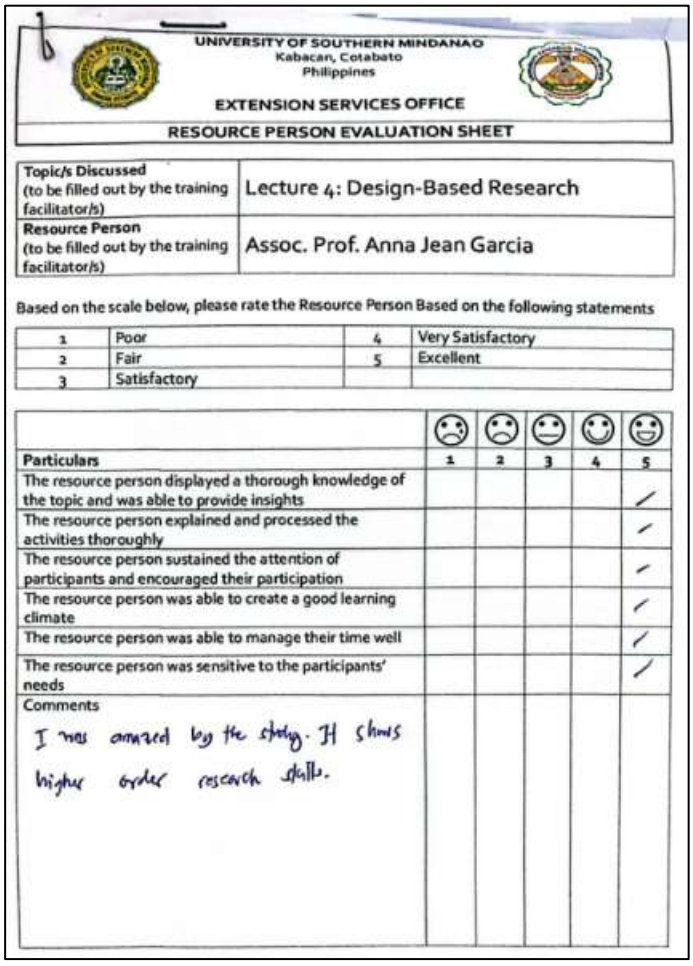
POST TRAINING EVALUATION

Training Title: Empowering Educators: Crafting Learning Materials and Implementing Design-Based Research
Sponsoring Agency: USM Graduate School and College of Science and Mathematics
Resource Person/s: Ms. Aurea Puyos, Dr. Ian June Garces, Dr. Debbie Marie Verzosa, Dr. Leorence Tandog, and Assoc. Prof. Anna Jean Garcia
Inclusive Date/s: May 30 – 31, 2025
Venue: Graduate School Hall, University of Southern Mindanao, Kabacan, Cotabato

Instructions
A. Please evaluate the training/activity by ticking the appropriate column.

		Very Satisfactory	Satisfactory	Fair	Poor
1	The objectives of the training were clearly defined.	✓			
2	Participation and interaction of the participants was encouraged.	✓			
3	The topics covered were relevant to the participants.	✓			
4	The content of the training was organized and easy to follow.	✓			
5	The materials distributed were helpful.		✓		
6	The training experience is useful to the participants' work.	✓			
7	The trainer was knowledgeable about the training topics.	✓			
8	The trainer was well prepared.	✓			
9	The training objectives were met.	✓			
10	The time allotted for the training was sufficient.		✓		
11	The venue and facilities were conducive for the activity.		✓		
12	Food was sufficient and filling.		✓		
13	The sponsors were approachable and readily available when needed.	✓			
14	Sessions were conducted on time.		✓		
15	Adequate time was allotted for the presentation and discussion of the topics.		✓		

B. Please write your answer on the space provided.
1. What did you like most about this training?
The topics are very useful and informative
2. What specific practice/s in your present work would you hope to change as a result of the training?
My way of writing math questions/problems
3. What aspects of the training could be improved?
Venue, food
4. What other trainings would you like to undergo in the future?
AI in Math Education.
5. What other comments would you like to add?
Very Good!



UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

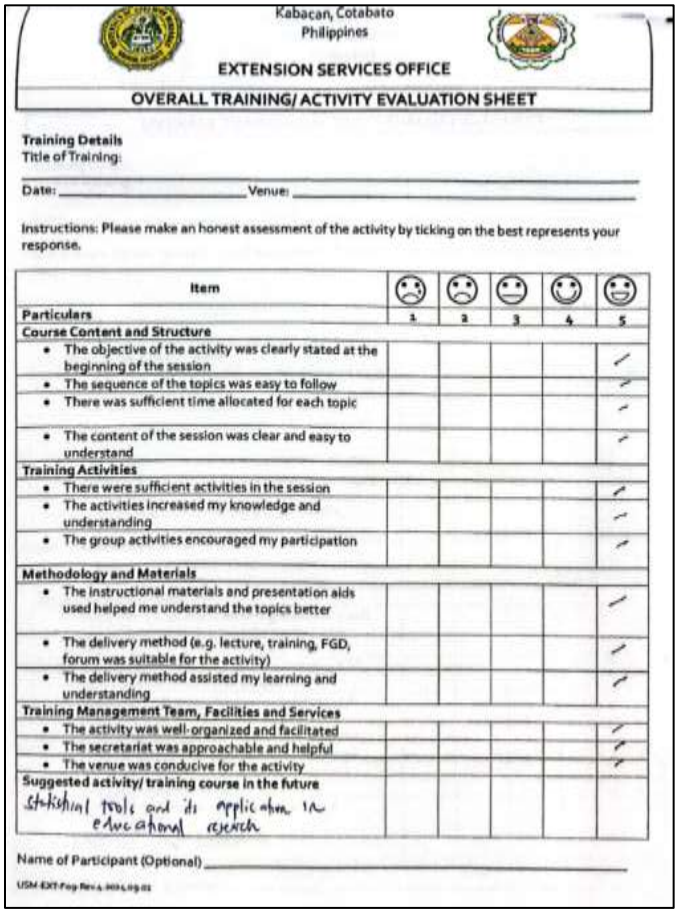
RESOURCE PERSON EVALUATION SHEET

Topic/s Discussed (to be filled out by the training facilitator/s)	Lecture 4: Design-Based Research
Resource Person (to be filled out by the training facilitator/s)	Assoc. Prof. Anna Jean Garcia

Based on the scale below, please rate the Resource Person Based on the following statements

1	Poor	4	Very Satisfactory
2	Fair	5	Excellent
3	Satisfactory		

Particulars	☹ 1	☹ 2	😐 3	☺ 4	☺ 5
The resource person displayed a thorough knowledge of the topic and was able to provide insights					✓
The resource person explained and processed the activities thoroughly					✓
The resource person sustained the attention of participants and encouraged their participation					✓
The resource person was able to create a good learning climate					✓
The resource person was able to manage their time well					✓
The resource person was sensitive to the participants' needs					✓
Comments I was amazed by the study. It shows higher order research skills.					



Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

OVERALL TRAINING/ ACTIVITY EVALUATION SHEET

Training Details
Title of Training:
Date: _____ Venue: _____

Instructions: Please make an honest assessment of the activity by ticking on the best represents your response.

Item	☹ 1	☹ 2	😐 3	☺ 4	☺ 5
Particulars					
Course Content and Structure					
• The objective of the activity was clearly stated at the beginning of the session					✓
• The sequence of the topics was easy to follow					✓
• There was sufficient time allocated for each topic					✓
• The content of the session was clear and easy to understand					✓
Training Activities					
• There were sufficient activities in the session					✓
• The activities increased my knowledge and understanding					✓
• The group activities encouraged my participation					✓
Methodology and Materials					
• The instructional materials and presentation aids used helped me understand the topics better					✓
• The delivery method (e.g. lecture, training, FGD, forum was suitable for the activity)					✓
• The delivery method assisted my learning and understanding					✓
Training Management Team, Facilities and Services					
• The activity was well-organized and facilitated					✓
• The secretariat was approachable and helpful					✓
• The venue was conducive for the activity					✓
Suggested activity/ training course in the future Statistical tools and its application in educational research					

Name of Participant (Optional) _____

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

Overall Training/Activity Evaluation

Training Detail

Name of Training: **Empowering Educators: Crafting Learning Materials and Design Implementing Design-Based Action Research**

Venue: **USM Graduate School**

Date: **May 30-31, 2025**

Particulars	Weighted Mean	Verbal Description
Course Content and Structure		
The objective of the activity was clearly stated at the beginning of the session	4.96	Excellent
The sequence of the topics was easy to follow	4.84	Excellent
There was sufficient time allocated for each topic	4.52	Excellent
The content of the session was clear and easy to understand	4.88	Excellent
Training Activities		
There was sufficient activities in the session	4.93	Excellent
The activities increased my knowledge and understanding	4.95	Excellent
The group activities encouraged my participation	4.81	Excellent
Methodology and Materials		
The instructional materials and presentation aids used helped me understand the topic better	4.62	Excellent
The delivery method (e.g. lecture training, FGD, forum) was suitable for the activity	4.72	Excellent
The delivery method assisted my learning and understanding	4.55	Excellent
Training Management Team, Facilities and Services		
The activity was well-organized and facilitated	4.43	Very Satisfactory
The secretariat was approachable and helpful	4.45	Very Satisfactory
The venue was conducive for the activity	4.51	Excellent

Rating Scale: 4.50-5.00 Excellent, 3.50-4.49 Very Satisfactory, 2.50-3.49 Satisfactory, 1.50-2.49 Fair, 1.00-1.49 Poor

SUMMARY OF RESOURCE PERSON/S' EVALUATION		Resource Person 1		Resource Person 2		Resource Person 3	
Item Code	Particulars	Weighted Mean	Verbal Description	Weighted Mean	Verbal Description	Weighted Mean	Verbal Description
1	The resource person displayed a thorough knowledge of the topic and was able to provide insights	4.76	Excellent	4.86	Excellent	5.00	Excellent
2	The resource person explained and processed the activities thoroughly	4.65	Excellent	4.79	Excellent	4.93	Excellent
3	The resource person sustained the attention of participants and encouraged their participation	4.43	VS	4.86	Excellent	5.00	Excellent
4	The resource person was able to create a good learning climate	4.62	Excellent	4.79	Excellent	4.97	Excellent
5	The resource person was able to manage their time well	4.73	Excellent	4.55	Excellent	4.93	Excellent
6	The resource person was sensitive to the participants' need	4.68	Excellent	4.83	Excellent	4.97	Excellent
	Total Mean Rating	4.65	Excellent	4.78	Excellent	4.97	Excellent

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

QUARTERLY MONITORING AND EVALUATION REPORT FOR EXTENSION

Project Title:	**Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools**	**Period Covered**	☒ 1st Quarter ☐ 3rd Quarter ☐ 2nd Quarter ☐ 4th Quarter
Proponent(s):	Leorence C. Tandog, Debbie Marie B. Verzosa, Jonald L. Pimentel, Philip Lester P. Benjamin, Leonard M. Paleta, Anna Jean S. Garcia, Jupiter G. Pilongo, Daryl Mae C. Mamon, Rowel P. Madio, Roel S. Valenton, Sandra A. Nanding, Lawton John A. Yabes	**Fund Source**	☒ Local ___Fund 101_____ ☐ External _____

Activities *Based on the Work Plan Schedule*	**Outputs**	**Accomplishments** Target (%) *Based on the Milestone in the Workplan*	**Accomplishments** Actual (%)	**(%) Completion (Cumulative)**	**Problems Encountered** *(if any)*	**Action Taken**	**Fund Utilization (%)**	**Remarks by Evaluator**
% Completion (Cumulative) from the previous quarter: 0%								
1. Building Capacity of Teachers in Instructional Material Development (one day)	Training design, workshop schedule and venue, committee in charge, processed COPD application	10%	0%	0%	Conflict of schedule; DepEd teachers and faculty were busy at the time, near semester end.	Training will be conducted together with the next capacity-building activity to allow more preparation time.	0%	
2. Development of Representation Approach-Based Learning Materials for Independent Learning of Mathematics	Diagnostic test result, some baseline information, PhD students identified topics for IM development and lesson study.	40%	0%	0%	Cannot proceed because the training on capacity must come first.	Activity postponed until capacity-building training is completed.	0%	

Prepared by:

LEORENCE C. TANDOG, PhD
Project Leader

Noted by:

CHERIE C. MANGAOANG, PhD
College Extension Coordinator

Evaluated by:

GLYN G. MAGBANUA, PhD
Director, Extension Services Office

Concurred by:

DEBBIE MARIE B. VERZOSA, PhD
Vice President for Research, Development and Extension

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

QUARTERLY MONITORING AND EVALUATION REPORT FOR EXTENSION

Project Title:	**Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools**	**Period Covered**	☒ 1st Quarter ☐ 3rd Quarter ☒ 2nd Quarter ☐ 4th Quarter
Proponent(s):	Leorence C. Tandog, Debbie Marie B. Verzosa, Jonald L. Pimentel, Philip Lester P. Benjamin, Leonard M. Paleta, Anna Jean S. Garcia, Jupiter G. Pilongo, Daryl Mae C. Mamon, Rowel P. Madio, Roel S. Valenton, Sandra A. Nanding, Lawton John A. Yabes	**Fund Source**	☒ Local ___Fund 101_____ ☐ External _____

Activities *Based on the Work Plan Schedule*	**Outputs**	**Accomplishments** Target (%) *Based on the Milestone in the Workplan*	**Accomplishments** Actual (%)	**(%) Completion (Cumulative)**	**Problems Encountered** *(if any)*	**Action Taken**	**Fund Utilization (%)**	**Remarks by Evaluator**
% Completion (Cumulative) from the previous quarter: 0 %								
1. Building Capacity of Teachers in Instructional Material Development (one day)	Training design, workshop schedule and venue, committee in charge, processed COPD application	10%	100%	10%	None	None	25.84%	
2. Development of Representation Approach-Based Learning Materials for Independent Learning of Mathematics (two months)	Diagnostic test result, some baseline information, PhD students identified topics for IM development and lesson study.	40%	100%	50%	None	None		
3. Validation and Packaging of Representation Approach-Based Learning Materials for Independent Learning of Mathematics (two months)	validated and packaged LMAPS	20%	100	70%	None	None		

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
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QUARTERLY MONITORING AND EVALUATION REPORT FOR EXTENSION

4. Building Capacity of Teachers on Action Research (one day)	Training design, workshop schedule and venue, committee in charge, processed COPD application	10%	100%	80%	None	None		

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QUARTERLY MONITORING AND EVALUATION REPORT FOR EXTENSION

Project Title:	**Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools**	**Period Covered**	☒ 1st Quarter ☒ 3rd Quarter ☒ 2nd Quarter ☐ 4th Quarter
Proponent(s):	Leorence C. Tandog, Debbie Marie B. Verzosa, Jonald L. Pimentel, Philip Lester P. Benjamin, Leonard M. Paleta, Anna Jean S. Garcia, Jupiter G. Pilongo, Daryl Mae C. Mamon, Rowel P. Madio, Roel S. Valenton, Sandra A. Nanding, Lawton John A. Yabes	**Fund Source**	☒ Local ___Fund 101___ ☐ External _____

Activities *Based on the Work Plan Schedule*	Outputs	Accomplishments: Target (%) *Based on the Milestone in the Workplan*	Accomplishments: Actual (%)	(%) Completion (Cumulative)	Problems Encountered *(if any)*	Action Taken	Fund Utilization (%)	Remarks by Evaluator
% Completion (Cumulative) from the previous quarter: 80%								
5. Implementation of Representation Approach-Based Learning Materials for Improved Learning of General Mathematics (two months)	Deployment & use of LMAPS by target beneficiaries	20%	75%	95%	None	None	40%	

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QUARTERLY MONITORING AND EVALUATION REPORT FOR EXTENSION

Project Title:	**Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools**	**Period Covered**	☒ 1st Quarter ☒ 3rd Quarter ☒ 2nd Quarter ☒ 4th Quarter
Proponent(s):	Leorence C. Tandog, Debbie Marie B. Verzosa, Jonald L. Pimentel, Philip Lester P. Benjamin, Leonard M. Paleta, Anna Jean S. Garcia, Jupiter G. Pilongo, Daryl Mae C. Mamon, Rowel P. Madio, Roel S. Valenton, Sandra A. Nanding, Lawton John A. Yabes	**Fund Source**	☒ Local ___Fund 101___ ☐ External _____

Activities *Based on the Work Plan Schedule*	Outputs	Accomplishments: Target (%) *Based on the Milestone in the Workplan*	Accomplishments: Actual (%)	(%) Completion (Cumulative)	Problems Encountered *(if any)*	Action Taken	Fund Utilization (%)	Remarks by Evaluator
% Completion (Cumulative) from the previous quarter: 95%								
5. Implementation of Representation Approach-Based Learning Materials for Improved Learning of General Mathematics (two months)	Deployment & use of LMAPS by target beneficiaries	20%	100%	100%	None	None	67%	

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Evaluated by:
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Director, Extension Services Office

Concurred by:
DEBBIE MARIE B. VERZOSA, PhD
Vice President for Research, Development and Extension

TO WHOM IT MAY CONCERN:

THIS IS TO CERTIFY that the extension project titled **"Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools (AY 2025-2026)"**, implemented by the University of Southern Mindanao at Salvacion High School, Matalam, Cotabato, has fully met and satisfied all the prescribed guidelines, standards, and requirements set forth under **JC3 CMO No. 18, Series of 2025.**

THIS IS FURTHER TO CERTIFY that, having successfully fulfilled the prerequisite monitoring and implementation compliance metrics under the aforementioned Joint Circular/CMO guidelines, the project was deemed **ELIGIBLE** for the conduct of the official Client Satisfaction Survey (CSS).

THIS LIKEWISE CERTIFIES that the **Terminal Report** for the project was officially completed, submitted, and duly received on time by the **Extension Services Office** in accordance with institutional schedules and project reporting timelines.

The project obtained a total of **87.2 points out of the maximum score of 100 points,** based on the results of the official Client Satisfaction Survey (CSS) conducted among the target beneficiaries.

Attached herewith is the official summary of the CSS Results conducted among the target beneficiaries.

GLYN B. GABANO-MAGBANUA

Director, Extension Services Office

I.8. Results of monitoring and evaluation are disseminated and discussed with concerned stakeholders.

CLIENT SATISFACTION SURVEY REPORT

Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools

Project Leader:

Leorence C. Tandog

Component Leaders:

PHILIP LESTER P. BENJAMIN
LEONARD M. PALETA
JUPITER G. PILONGO
DEBBIE MARIE B. VERZOSA

Fund Source:
FUND 01

Period of Implementation:
2025

Community Beneficiaries:
Salvacion Highschool, Matalam, Cotabato

Participants:

Anna Jean S. Garcia
Rowel P. Madio,
Daryl Mae C. Mamon
Sandra A. Nanding
Roel S. Valenton
Lawton John A. Yabes
Dominic C. Carajay
Lidey Sultan
Aurea Puyos
Ian June Garces
Jeaneth R. Licaros
Jead M. Macalisang
Mauricio Jr. J. Magallon
Hannah Jane Faith Palmos
Jennifer Pama
Fitzmee Ann D. Tamulak
Arnel B. Toledo
Maria Luz D. Calibayan
Shandra C. Gonsang

Abstract

The Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools extension project was implemented to support mathematics instruction at Salvacion High School, Matalam, Cotabato, through the development, validation, and implementation of representation-based Learning Activity Pages (LAPs) and teacher capacity-building activities. The project sought to provide contextualized instructional resources that could support classroom teaching and independent learning while responding to the instructional needs of learners and teachers in a remote barangay high school. This report presents the results of the Client Satisfaction Survey (CSS), which assessed the beneficiaries' satisfaction with the conduct and implementation of the project. A quantitative descriptive research design was employed using the CHED-approved Client Satisfaction Survey prescribed under CHED Memorandum Order No. 18 (2025). The survey was administered to fifty (50) project beneficiaries, consisting of teachers and students of Salvacion High School, and the responses were analyzed using the weighted mean as the primary descriptive statistical measure. The findings revealed generally favorable ratings across the ten (10) survey indicators, with weighted mean scores ranging from **3.80** to 4.52. The highest rating (4.52) was obtained for overall satisfaction, followed by willingness to recommend the project to others (4.50). The indicators on implementation of project objectives, responsiveness to participants' suggestions, and improvement in the quality of life of beneficiaries each obtained a weighted mean of 4.46, while knowledge and skills acquired, addressing community needs, clarity of project activities, and implementation of activities as scheduled received weighted mean scores of 4.40, 4.36, 4.34, and 4.29, respectively, all interpreted as Strongly Agree. The absence of negative effects obtained the lowest weighted mean of 3.80, corresponding to the Agree category. Despite this variation, the project obtained an overall grand mean of 4.36, interpreted as Excellent, indicating that the beneficiaries gave highly favorable ratings to the conduct and implementation of the extension project. The qualitative feedback further indicated that the beneficiaries appreciated the instructional approaches employed during the implementation and expressed interest in the continuation and expansion of similar learning activities while recommending sustained implementation support and refinement of the instructional materials. These findings provide useful guidance for improving future implementations of the project and similar extension initiatives that support mathematics education in geographically isolated and underserved communities.

Keywords: client satisfaction survey, extension project, learning activity pages, mathematics education, representation-based learning, remote schools

Introduction

Assessing the satisfaction of project beneficiaries is an essential component of extension program evaluation, as it provides evidence on the quality, relevance, and effectiveness of project implementation. In higher education institutions, the Client Satisfaction Survey (CSS) serves as a standardized tool for obtaining beneficiaries' feedback regarding the conduct and outcomes of extension initiatives. The implementation of the CSS is mandated under CHED Memorandum Order No. 18 (2025), which requires state universities and colleges to administer a standardized survey instrument for all extension projects.

The Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools extension project was implemented at Salvacion High School in Matalam, Cotabato to address the persistent challenges in mathematics education brought about by the shortage of qualified mathematics teachers and the limited availability of instructional resources in remote schools. The project introduced representation-based, self-instructional Learning Activity Pages (LAPs), conducted capacity-building activities for teachers, and supported the validation, refinement, and implementation of research-based instructional materials designed to promote independent learning and strengthen students' mathematical competencies. Assessing the beneficiaries' perceptions is therefore necessary to determine whether these interventions effectively addressed the educational needs of the partner school and contributed to improving the quality of mathematics instruction and learning.

The CSS is particularly relevant to this project because the teachers and students who participated in the implementation activities are in the best position to evaluate the relevance, organization, and effectiveness of the developed instructional materials and the capacity-building interventions provided. Their assessment offers valuable information on the responsiveness of the project to the identified needs of the partner school, the adequacy of the learning materials and training activities, and the extent to which the project supported the implementation of representation-based approaches to mathematics instruction. Such feedback also provides important insights that may guide the refinement of the developed Learning Activity Pages (LAPs) and strengthen future extension initiatives designed to improve mathematics education in underserved schools.

The findings of this assessment will provide evidence to support the continuous enhancement of research-based extension programs that promote quality mathematics education in geographically isolated and underserved communities. Moreover, the results may serve as a useful reference for higher education institutions, extension practitioners, school administrators, and partner schools in designing future initiatives that strengthen teacher capacity, improve the development and utilization of contextualized instructional materials, and promote equitable access to quality mathematics education in remote learning environments.

General Objective

To determine the satisfaction of the beneficiaries regarding the conduct and implementation of the Strengthening Barangay High Schools Project.

METHODOLOGY

A quantitative descriptive research approach was employed to assess the satisfaction of the beneficiaries regarding the conduct and implementation of the project. The CHED-approved Client Satisfaction Survey (CSS), prescribed under CHED Memorandum Order No. 18 (2025), was administered to all fifty (50) beneficiaries, consisting of teachers and students from Salvacion High School in Matalam, Cotabato, who participated in the implementation of the Strengthening Barangay High Schools Project upon the completion of its implementation.

The survey instrument comprises ten (10) indicators that evaluate various aspects of project implementation, including responsiveness to community needs, knowledge and skills acquired, achievement of project objectives, implementation of activities as scheduled, clarity of project activities, responsiveness to participants' suggestions, improvement in the quality of life of beneficiaries, absence of negative effects resulting from the project, overall satisfaction, and willingness to recommend the project to others. Responses were recorded using a five-point rating scale, where a score of 5 represents Very High Satisfaction or Very Likely, while a score of 1 represents Very Low Satisfaction or Very Unlikely.

The survey responses were analyzed using descriptive statistics. Specifically, the weighted mean was computed to determine the beneficiaries' assessment for each survey indicator, while the grand mean was calculated to describe the overall assessment of the conduct and implementation of the extension project.

RESULT AND DISCUSSION

The results of the Client Satisfaction Survey, interpreted using the rating scale presented in Table 1 and summarized in Figure 1 and Table 2, indicate that the beneficiaries gave highly favorable ratings to the implementation of the Strengthening Barangay High Schools Project. The weighted mean scores ranged from 3.80 to 4.52, indicating that the respondents generally agreed that the project produced no negative effects, strongly agreed with the statements describing the conduct and implementation of the project, expressed very high satisfaction, and were very likely to recommend the project to others. These findings suggest that the project's interventions, particularly the development and implementation of representation-

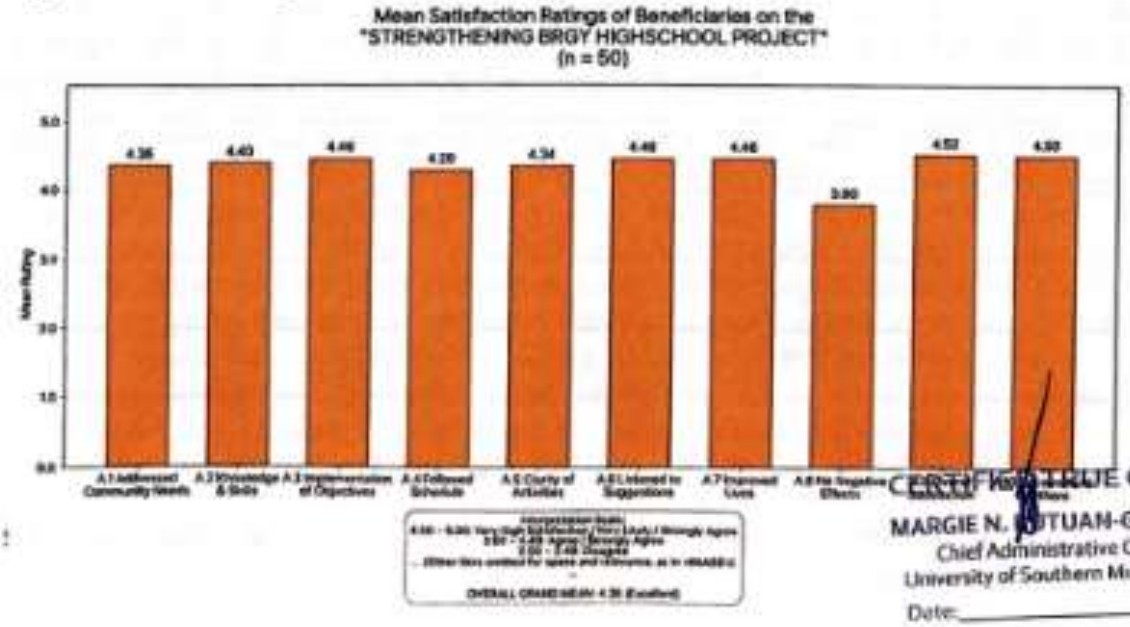
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based Learning Activity Pages (LAPs), teacher capacity-building activities, and the deployment of research-based instructional materials at Salvacion High School in Matalam, Cotabato, were positively received by the participating teachers and students. The favorable ratings further indicate that the project effectively addressed important aspects of mathematics instruction by providing contextualized learning resources and professional support for both teachers and learners.

Table 1. Interpretation of the Client Satisfaction Survey Rating Scale

Rating Scale	Range / Interval	Descriptive Rating (Q1–Q8)	Satisfaction Level (Q9)	Likelihood of Recommendation (Q10)
5	4.21 – 5.00	Strongly Agree	Very Satisfied	Very Likely
4	3.41 – 4.20	Agree	Satisfied	Likely
3	2.61 – 3.40	Slightly Agree	Slightly Satisfied	Slightly Likely
2	1.81 – 2.60	Disagree	Dissatisfied	Unlikely
1	1.00 – 1.80	Strongly Disagree	Very Dissatisfied	Very Unlikely

The highest weighted mean score (4.52) was obtained for overall satisfaction (A.9), indicating that the beneficiaries were highly satisfied with the conduct and implementation of the project. This was closely followed by recommending the project to others (A.10) with a weighted mean of 4.50, reflecting the respondents' confidence in the project's value and their willingness to encourage similar schools to participate in comparable initiatives. Likewise, knowledge and skills acquired (A.3), responsiveness to participants' suggestions (A.6), and improvement in the quality of life of beneficiaries (A.7) each obtained a weighted mean of 4.46, corresponding to Strongly Agree. These findings suggest that the project successfully enhanced participants' understanding of representation-based approaches to mathematics instruction while maintaining responsiveness to the needs and feedback of its beneficiaries throughout implementation. The collaborative development, validation, and deployment of the Learning Activity Pages (LAPs), together with the conduct of teacher training and capacity-building activities, likely contributed to these positive perceptions by providing participants with practical instructional resources and opportunities to strengthen their competencies in mathematics education.



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Chief Administrative Officer
University of Southern Mindanao
Date:_____

Figure 1. Mean Satisfaction Ratings of Beneficiaries on the Strengthening Brgy Highschool Project (n = 50)

The indicators on knowledge and skills acquired (A.2), addressing community needs (A.1), clarity of project activities (A.5), and implementation of activities as scheduled (A.4) obtained weighted mean scores of 4.40, 4.36, 4.34, and 4.29, respectively, all interpreted as Strongly Agree. These findings indicate that the beneficiaries recognized the project's relevance to the educational needs of the partner school and positively assessed the organization and delivery of its activities. The implementation of needs assessment activities, teacher orientations, collaborative lesson development, validation of instructional materials, and classroom deployment of the Learning Activity Pages (LAPs) likely contributed to these favorable assessments by ensuring that the project interventions were systematically planned and responsive to the instructional context of the school.

The indicators on knowledge and skills acquired (A.2), addressing community needs (A.1), clarity of project activities (A.5), and implementation of activities as scheduled (A.4) obtained weighted mean scores of 4.40, 4.36, 4.34, and 4.29, respectively, all interpreted as Strongly Agree. These findings indicate that the beneficiaries recognized the project's relevance to the educational needs of the partner school and positively assessed the organization and delivery of its activities. The implementation of needs assessment activities, teacher orientations, collaborative lesson development, validation of instructional materials, and classroom deployment of the Learning Activity Pages (LAPs) likely contributed to these favorable assessments by ensuring that the project interventions were systematically planned and responsive to the instructional context of the school.

The project obtained an overall grand mean of 4.36, interpreted as Excellent, demonstrating that the beneficiaries gave highly favorable evaluations to the overall conduct and implementation of the extension project. The consistently positive ratings across almost all survey indicators reflect the project's effectiveness in delivering research-based instructional interventions that were perceived to be relevant, organized, and beneficial to the intended beneficiaries. The findings likewise indicate that the project was implemented in a manner that fostered positive engagement among teachers and students while supporting the broader objective of strengthening mathematics education in a remote barangay high school.

Among all survey indicators, absence of negative effects (A.8) obtained the lowest weighted mean score (3.80), corresponding to Agree. Although this remains a positive evaluation, it was comparatively lower than the ratings obtained for the other dimensions of project implementation. This result suggests that while the beneficiaries generally perceived the project as beneficial and free from significant adverse effects, some participants may have experienced minor challenges during implementation or recognized areas requiring further refinement. Considering that the project introduced new representation-based instructional materials and independent learning approaches, it is possible that some teachers and students required additional time, guidance, or familiarization to fully adapt to these innovations. The finding highlights

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Chief Administrative Officer

the importance of providing continuous technical assistance, strengthening orientation activities, and refining the instructional materials based on users' experiences and feedback to ensure their effective utilization in future implementations.

Table 2. Mean Satisfaction Ratings of Beneficiaries on the "Strengthening Barangay Highschool" Project (n = 50)

Indicator	Weighted Mean	Interpretation
A.1 Addressed Community Needs	4.36	Strongly Agree
A.2 Knowledge & Skills	4.40	Strongly Agree
A.3 Implementation of Objectives	4.46	Strongly Agree
A.4 Followed Schedule	4.29	Strongly Agree
A.5 Clarity of Activities	4.34	Strongly Agree
A.6 Listened to Suggestions	4.46	Strongly Agree
A.7 Improved Lives	4.46	Strongly Agree
A.8 No Negative Effects	3.80	Agree
A.9 Overall Satisfaction	4.52	Very High Satisfaction
A.10 Recommend to Others	4.50	Very Likely
OVERALL GRAND MEAN	**4.36**	**Excellent**

The findings indicate that extension project was successfully implemented and positively received by its beneficiaries. The consistently high ratings across the survey indicators, together with an overall grand mean of 4.36, demonstrate that the project effectively provided relevant instructional resources, strengthened teacher capacity, and supported mathematics learning through the implementation of representation-based Learning Activity Pages (LAPs). The comparatively lower rating for the absence of negative effects underscores the need to continuously refine the instructional materials, sustain technical support, and strengthen follow-up activities to ensure that future implementations remain responsive to the needs of teachers and students while further enhancing the quality and sustainability of mathematics instruction in remote barangay high schools.

Beneficiaries' Feedback and Recommendations

The qualitative feedback provided by the beneficiaries complements the findings of the Client Satisfaction Survey by offering deeper insights into their experiences during the implementation of the Strengthening Barangay High Schools extension project. Overall, the responses reflected favorable perceptions of the project, with both students and teachers expressing appreciation for the learning activities, instructional approaches, and representation-based learning materials introduced during the implementation. At the same time, the beneficiaries identified several recommendations that may further enhance future implementations of the project and similar extension initiatives.

One of the most prominent themes that emerged from the responses was the beneficiaries' appreciation of the teaching approaches employed by the project team. Many students described the learning sessions as understandable, engaging, and enjoyable, noting that the explanations and demonstrations helped them better follow the mathematics lessons. Several respondents also expressed that they appreciated

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Chief Administrative Officer

the patience and commitment demonstrated by the project implementers throughout the conduct of the activities.

"Nagustuhan ko ang kanilang pagtuturo sa amin dahil malintindihan mo ang kanilang pagtuturo talaga." —P6

Similarly, another participant shared:

"Nagustuhan namin ang turo ng USM kasi mas madali na naming maintindihan ngayon kaysa sa dati." —P26

These responses indicate that the beneficiaries viewed the instructional strategies and representation-based Learning Activity Pages (LAPs) positively and appreciated the learning opportunities provided through the extension project.

Another recurring theme was the beneficiaries' strong interest in the continuation of the project. Numerous respondents expressed their hope that the University of Southern Mindanao would revisit the school and continue conducting mathematics learning sessions. Several participants believed that additional learning opportunities would allow them to further develop their understanding of mathematics and gain greater confidence in solving mathematical problems.

"Sana bumalik pa sila para matuto pa ang mga estudyante." —P18

Likewise, one respondent remarked:

"Gusto ko is babalik pa sila dito sa susunod na araw o buwan at magturo ulit kasi para makatuto ng maayos." —P16

These comments suggest that the beneficiaries appreciated the project's implementation and expressed a desire for sustained learning support beyond the initial implementation period.

The responses likewise revealed the beneficiaries' interest in broadening the mathematics topics covered by future activities. Several students recommended including additional lessons on Algebra, mathematical problem solving, advanced mathematics, and other concepts that they considered difficult. Others suggested providing more opportunities for guided practice, review sessions, and problem-solving activities to help them better understand mathematical concepts.

"Sana maturo sa amin ang mga Algebraic Expression at mga multinomials." —P21

Similarly, another respondent suggested:

"Ang gusto namin ay lagi kaming turuan sa iba't ibang problem sa math para sa susunod malaman na namin." —P9

These recommendations indicate that the beneficiaries recognized the value of the learning sessions and expressed interest in expanding similar activities to cover a wider range of mathematics competencies in future implementations.

Several beneficiaries also recommended extending similar extension initiatives to other learners and schools facing comparable educational challenges. Respondents

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expressed appreciation that their school was selected as the project's partner institution while encouraging the University to provide similar opportunities to other communities.

"Sana marami pa ang inyong matulungan at maturuan na pearalan."—P27

Likewise, another beneficiary recommended:

"Ipagpatuloy ang proyekto at mas marami pang paaralan ang makinabang."—P50

These responses reflect the beneficiaries' positive perception of the project and their belief that similar extension initiatives may also be beneficial to other barangay high schools experiencing similar instructional challenges.

Teacher respondents likewise emphasized the importance of sustaining implementation support after the project's completion. One teacher noted that the learning materials provided additional instructional resources that could support classroom teaching while also helping teachers better understand learners' mathematical difficulties.

"The project help us mathematics teacher to teach students in more engaging way... The project also help teachers analyze the problem of students in terms of mathematical [difficulties] and teach us how to deal with it effectively." —P46

Other teacher respondents recommended the continued provision of learning materials and periodic monitoring to support the implementation of the developed instructional resources within the school.

"Continue supervision and giving learning materials to the students." —P48

These recommendations underscore the importance of providing continuing technical support and monitoring to facilitate the sustained utilization and refinement of the developed Learning Activity Pages (LAPs) in future implementations.

The qualitative feedback complements the findings of the Client Satisfaction Survey by demonstrating that the beneficiaries generally viewed the extension project positively and appreciated the learning opportunities it provided. The respondents consistently expressed satisfaction with the instructional approaches employed during the implementation while recommending the continuation of mathematics learning sessions, expansion of lesson coverage, sustained implementation support, and wider adoption of similar initiatives in other schools. Although the majority of the feedback was favorable, a small number of beneficiaries noted that some mathematical examples and explanations were occasionally difficult to follow or required further clarification. These comments suggest the importance of continuously refining the instructional strategies and learning materials to accommodate the varying levels of mathematical preparedness among learners. Future implementations may also consider providing additional guided practice, contextualized examples, and reinforcement activities to further enhance learners' understanding and engagement. Collectively, these insights provide valuable guidance for project implementers in refining succeeding phases of the initiative and strengthening the delivery of extension

programs that support mathematics education in geographically isolated and underserved communities.

REFERENCE

CHED Memorandum Order No. 18 (2025). *Revised Guidelines and Instruments for Client Satisfaction Survey of Extension Projects in SUCs.*

ATTACHMENTS

I. PROJECT MANAGEMENT TEAM (PMT)

Project Leader and Activity Leaders:

Project Leader : **LEORENCE C. TANDOG** *(with Special Order)*
Component Leader : **PHILIP LESTER P. BENJAMIN** *(with Special Order)*
LEONARD M. PALETA *(with Special Order)*
JUPITER G. PILONGO *(with Special Order)*
DEBBIE MARIE B. VERZOSA *(with Special Order)*

Date	Activity	Responsible Persons	Core Topics Covered
March – May, 2026	Development of Learning Materials	1. Benjamin, Philip Lester P. 2. Garcia, Anna Jean S. 3. Madio, Rowel P. 4. Mamon, Daryl Mae C. 5. Nanding, Sandra A. 6. Paleta, Leonard M. 7. Pilongo, Jupiter G. 8. Tandog, Leorence C. 9. Verzosa Debbie Marie B. 10. DOST-SEI Project Strand-N Scholars, PhD Ed Math and MST Math students	IM 1: Reading and Writing Numbers IM 2: Introduction to Sets IM 3: Quantitative Reasoning & Data Sense – Making
June – July, 2026	Validation and Packaging of Learning Materials	1. Garcia, Anna Jean S. 2. Mamon, Daryl Mae C. 3. Nanding, Sandra A. 4. Paleta, Leonard M. 5. Pilongo, Jupiter G. 6. Tandog, Leorence C.	

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II. Documentation



I.9. Re-planning of activities based on feedback is conducted.

I.10. Accomplishment and terminal reports are filed and submitted on time.

Narrative/Terminal Report

Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools

Leorence C. Tandog, Ph.D.
Project Team Leader

Funded by

USM Fund 101

Terminal Report
March 2026

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato

ABSTRACT

Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools

Project members: *Leorence Tandog, Sandra Nanding, Philip Lester Benjamin, Jupiter Pilongo, Rowel Madio, Lawton John Yabes, Dominic Carajay, Lidey Sultan, Debbie Marie Verzosa, Jonald Pimentel, Leonard Paleta, Anna Jean Garcia, Daryl Mae Mamon, Jeaneth Licaros, Roel Valenton, Jennifer Pama, Arnel Toledo, DOST-SEI Project Strand-N Scholars, MST and PhD Ed Math Students*

This extension project aimed to improve mathematics learning in barangay high schools, with Salvacion High School in Cotabato serving as the primary beneficiary, through the development and implementation of representation-based, self-instructional learning materials. The project responded to persistent challenges faced by barangay high schools in the Philippines, including the shortage of qualified teachers, limited instructional resources, and consistently low performance in national achievement assessments. It built on a research initiative launched in 2021 that introduced representation-based instructional materials, which demonstrated positive effects on students' understanding of mathematics and science.

The project engaged faculty members and graduate students from the PhD in Education and MST in Mathematics programs in collaborative lesson study, materials development, and action research. A systematic implementation process was followed, which included baseline data collection, teacher training, material development, validation and refinement, and classroom implementation. As a result, the project produced Learning Activity Pages (LAPs) designed to support independent learning and address identified learning gaps in mathematics in a remote area.

The implementation was conducted at Salvacion High School with the active support of the teachers and the school heads. The effectiveness of the intervention was assessed using pre- and post-tests on mathematical achievement and numeracy, student feedback, and teacher observations. Findings indicated a significant improvement in the numeracy skills of the student respondents, particularly in the various mathematical thinking skills. Moreover, the school beneficiary demonstrated enhanced overall performance, as reflected in their better rankings in district-wide competitions and increase in the number of senior high school students who qualified to enroll at USM based on USMCEE score.

The results of the project provided empirical evidence to support further refinement and possible scaling of the developed materials for use in other low-resource educational settings. Overall, the project contributed to the advancement of inclusive, equitable, and quality education by empowering students and teachers through accessible, research-based, and context-responsive learning resources.

Keywords: *Representation-Based Learning, Self-Instructional Materials, Learning Activity Sheets, Mathematics Education, Barangay High Schools*

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A. BASIC INFORMATION		
1. Title	Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools	
2. Status	☐ Ongoing ☐ Completed	
3. Project Leader Study Leader	**Dr. Leorence C. Tandog** College of Science and Mathematics	
Email Address	lctandog@usm.edu.ph	
Contact Number	09466115568	
4. Lead Unit/College	College of Science and Mathematics	
Collaborating Unit/College	DepEd Cotabato Division	
5. Category	☐ Program ☑ Project ☐ Study	
6. Classification	☐ Research	☐ Development ☑ Extension
	☐ Basic ☐ Applied	☐ Pilot Testing ☐ Prototype Development ☐ Tech. Promotion/Commercialization
7. Thematic Area	☑ Quality Learning, Skills Development, and Literacy ☐ Social Development, and Strong Institutions ☐ Preservation of Culture ☐ Environmental Protection, Conservation, and Risk Reduction ☐ Food Security and Poverty Reduction ☐ Good Health and Well-being ☐ Innovations in Science, Engineering, and Technology ☐ Sustainable Entrepreneurship and Management	
8. Sustainable and Development Goals	☐ No Poverty ☐ Zero Hunger ☐ Good Health & Well-Being ☑ Quality Education ☐ Gender Equality ☐ Clean Water & Sanitation ☐ Affordable and Clean Energy ☐ Decent Work & Economic Growth ☐ Industry Innovation & Infrastructure	☐ Reduced Inequalities ☐ Sustainable Cities & Communities ☐ Responsible Consumption & Production ☐ Climate Action ☐ Life Below Water ☐ Life on Land ☐ Peace, Justice and Strong Institutions ☐ Partnership for the Goals
9. Project Duration	One year	
10. Project Location	Matalam, Cotabato	
11. Total Budget	PhP 60,000	

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tertiary education, a critical pathway to socio-economic advancement and improved quality of life, particularly for learners in remote areas.

Grounded in lesson study and collaborative educational research conducted by faculty members of the Mathematics Department and graduate students, the project supported professional development and strengthened academic–community partnerships.

Furthermore, this initiative aligned with the broader goal of achieving inclusive and equitable quality education. The approach and materials can be adapted for use in other low-resource schools across the country, positioning the project as a potential model for broader implementation. By supporting barangay high schools, this project helps ensure that Filipino learners have access to meaningful and quality learning experiences, regardless of their geographic location.

Objectives

This project aimed to enhance the mathematics education received by students in barangay high schools in DepEd Cotabato with the use of carefully designed and validated self-instructional LMs.

The specific objectives of the extension project were to:

1. **strengthen** mathematics teachers' capacity to develop representation-based, self-instructional materials and to conduct action research or design-based research using these materials;
2. **engage** teachers in the collaborative development of research lessons and the design of self-instructional learning materials (LMs) in the form of Learning Activity Pages (LAPs);
3. **validate, pilot-test, and refine** activity sheets to effectively facilitate independent learning of mathematics concepts and skills;
4. **enhance** mathematics performance and numerical literacy among barangay high school students through the implementation of action research using the developed instructional materials; and
5. **improve** the overall performance of the target school and increase the chances of its senior high school (SHS) students being admitted to the University of Southern Mindanao (USM).

2. Review of Related Literature

Barangay high schools, formerly known as barrio high schools, were established in 1964 to provide wider access to secondary education (Orata, 1979). Since then, additional barangay high schools have opened with the passage of RA 6054 or the "Barrio High School Charter" in 1969. The establishment of barangay high schools is considered as equalizing opportunity for all Filipino children to access education regardless of their place of residence or economic condition.

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The performance of Philippine barangay schools has always been viewed to be inferior. In 1987 the Department of Education (DepEd) temporarily halted the opening of barangay high schools with acknowledgement that the quality of instruction in most of the barangay high schools suffered as evidenced by poor results in national achievement tests (DepEd DO 69, s. 1987).

Self-regulated and independent study is vital in cases where teachers are not available to facilitate learning. Effective LMs significantly support independent learning since resources that can be learned without needing the assistance of a teacher can empower students to take control of their studies, learn at their own pace, and develop self-discipline and independent thinking. Research shows that supplemental printed materials significantly facilitate successful learning of math concepts (Brown and Gilmer, 2009) and self-instructional worked examples are effective in the development of both conceptual and procedural knowledge (Sheldon, 2013).

In 2021, we initiated a multi-dimensional approach to respond to the challenges that emerged from the urgent educational adaptations driven by the pandemic through material and technology tools development (Tandog & Verzosa, 2021). Our project introduced teaching innovations that utilized interactive elements, visual features, storytelling, and manipulable representations. Various studies have shown that these features and tools enhance learning (De las Peñas & Bautista, 2008), facilitate visualization (Taka, Taka, & Budinski, 2010), and develop creativity (Shelomovskiy & Nosulya, 2012). Representation is an important element in the study of mathematics and is considered at the heart of cognitions associated with mathematical activity (Kaput, 1987).

3. Methodology

A. Development Phase:

1. Baseline Data Collection / Needs Assessment

Surveys were conducted on school performance and admission SHS graduates to college to profile Salvacion High School. Ocular visits and interviews with teachers and school heads assessed existing learning resources, identified students' learning gaps, and considered contextual factors for project implementation. A diagnostic pretest was also administered to determine specific student needs to guide material development.

2. Planning and Training

An orientation introduced project goals, and the learning needs to be addressed. Training was conducted on the representation approach, scaffolding techniques, action research, and design-based research to support teachers in material development. Plans of activities for developing, reviewing, validating, and pilot-testing instructional materials were prepared.

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3. Development, Validation, Pilot Testing, and Refinement

Instructional materials were developed collaboratively by MST and PhD students with

faculty of the Mathematics and Statistics Department as subject experts. Faculty and students validated the content, and pilot testing involved selected high school students to assess engagement and learning outcomes. Materials were refined using feedback from needs assessment, validation, and pilot testing to suit students' capabilities and curriculum requirements.

4. Packaging and Reproduction of LAPs

Final layouts considered cost-efficiency, readability, and usability. LAPs were reproduced for target beneficiaries, and implementation feedback informed refinement for potential future use, patenting, and wider dissemination.

C. Implementation Phase

The project was implemented at Salvacion High School, an annex of Kibia High School. Support was provided to teachers and the TIC during student engagement, outputs were evaluated to guide ongoing support, and action research assessed improvements in learning outcomes.

D. Evaluation Phase

Project effectiveness was measured through comparison of pretest and posttest scores, student outputs, and teacher observations. Student feedback was gathered through interviews and focus groups. Impact on school operations was assessed via principal and teachers' narratives on how the materials addressed teacher scarcity and improved school performance.

4. Results and Discussion

Baseline data

An ocular site visit and interviews conducted with the teachers and the former Principal of Salvacion High School at the start of the extension project revealed critical gaps in instructional support for mathematics education. One of the most pressing issues identified was the lack of learning resources, particularly in mathematics, as the Department of Education (DepEd) has been unable to provide textbooks for the subject. Additionally, it was found that none of the teachers in junior high school specialized in mathematics. Instead, mathematics classes are handled by teachers with academic backgrounds in Science and Filipino, underscoring the urgent need for subject-specific instructional support.

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The results of the diagnostic tests, as shown in Figure 4, indicate overall low performance, underscoring significant gaps in foundational mathematical understanding and reasoning. Particularly low performance was observed in the domain of numbers, where several high students still showed difficulty in reading and writing numbers and in identifying place values.

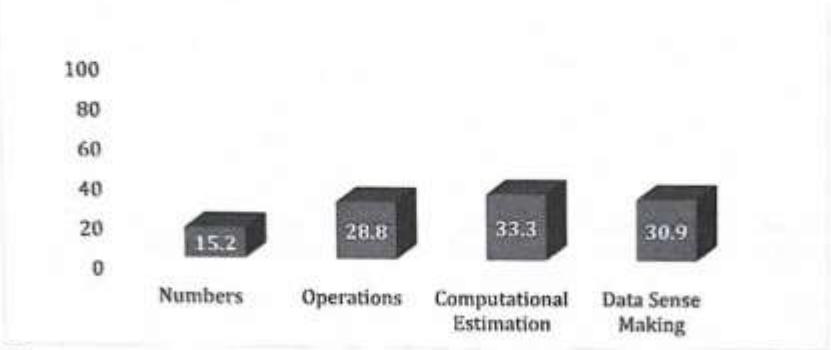


Figure 4. Average Percent Scores of Students in Diagnostic Test Items

A separate diagnostic test was also conducted to Senior High School students to determine their potential of passing a college admission test, particularly, the USM CEE. Of the 31 students, only 5 (16.1%) could potentially pass the set percentage cut-off score for board courses, another 5 (16.1%) for board courses while the majority (21 or 61.7%) would not qualify to any programs based on their performance on the test that included items that best predict USM-CEE.

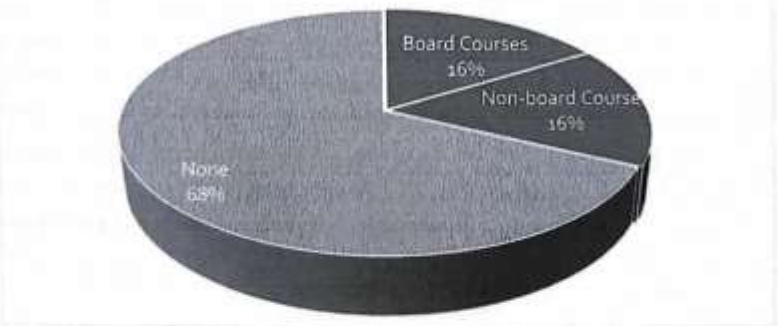


Figure 5. Percent Distribution of Respondents According to their Potential Performance in USM-CEE

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Figure 6. Salvacion HS senior high school students taking the diagnostic test

Overall, the performance results from the various assessments are consistent with the findings of the EDCOM 2 report and reveal a pressing need to strengthen mathematics instruction in the identified partner school. These findings validate the focus of the extension project on developing representation-based, self-instructional LMs designed to reinforce foundational skills and promote independent learning. The targeted interventions, implemented through Learning Activity Pages (LAPs), aim to address these deficiencies systematically beginning with number concepts and progressing to operations and estimation within meaningful problem contexts, ultimately extending toward higher-order mathematical thinking skills.

A meeting was conducted in August 2025 with the newly assigned principal of Salvacion High School, followed by a separate meeting in September 2025 with the teachers, to orient them on the extension project, the results of the diagnostic assessments, and the developed instructional materials intended to improve students' mathematics competency. They were also informed about the proposed interventions and the ways in which they could assist and collaborate, particularly in conducting action research. A personal invitation to participate in the capacity-building program on instructional material (IM) development was likewise extended during these meetings.



Figure 7. Courtesy meeting with the new principal of Salvacion High School.

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Figure 8. Orientation meeting with Salvacion HS teachers.

Capacity Building of Teachers

This project started with the enhancement of teachers' capacity in instructional material development and the conduct of action research as essential inputs to the implementation of the extension program. To achieve this objective, two seminar-workshops were conducted, with participants including graduate students engaged in curriculum development, teachers from the extension site, and other interested educators.

The first was a two-day seminar-workshop designed to strengthen three key areas of professional growth: instructional material development using representation-based approaches, the conduct of action research, and an understanding of design-based research. The seminar was carefully structured to enable participants to develop effective curriculum materials while simultaneously engaging in action research to improve instructional practice. Design-based research was introduced to equip participants—particularly the graduate students—with the research skills necessary for the continuous refinement of the developed materials for wide-scale distribution.

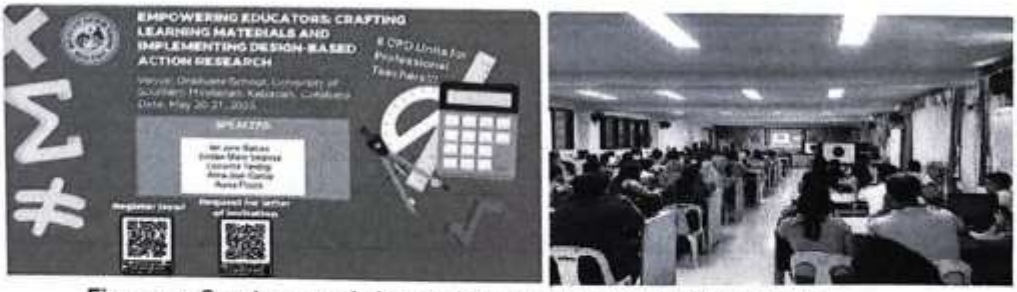


Figure 9. Seminar-workshop publication material and attendees

The seminar provided a space for participants to collaborate, share ideas, and create instructional tools they can apply in their own classrooms, and possible action research while implementing the innovations. The seminar workshop was attended by 72 teachers who highly rated the various aspects of the seminar with an overall rating of 4.71 (excellent). It also contributed to professional growth of teachers, including those from the beneficiary school with the PRC approved 8 CPD points for the seminar.

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Figure 12. Sample of zines produced by seminar participants

The seminar workshop was attended by 102 teachers, who rated the event very highly, giving it an overall score of 4.88 (excellent), reflecting strong satisfaction with the content, organization, and practical applicability of the activities. The comments extracted from the

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Overall Training Evaluation Sheets has three themes:

1. Positive and Enriching Training Experience. Participants described the training as enriching, insightful, and valuable, indicating that the session provided meaningful learning experiences. Many reported gaining new knowledge and insights. The creativity introduced with zines generated interest among participants in adopting creative approaches as instructional tools.

2. Contribution to Professional Practice. Participants acknowledged that the seminar enhanced their knowledge and skills, enabling them to improve and adapt their professional practice. They noted that the session provided practical ideas and tools to support their teaching, particularly in numeracy and literacy instruction.

3: Desire for Continuous Professional Development. Participants expressed strong interest in attending additional seminars and training programs, particularly those focused on strengthening pedagogy and instructional skills. They also suggested incorporating digital or software-based demonstrations, such as Canva and other applications, to better support teachers who prefer computer-based activities over handmade outputs.



Figure 13. Participants of the seminar-workshop with MST and PhD Ed Math Students

Design, Development, Validation, and Development of LMs

The extension project initially intended to involve the mathematics teacher at the beneficiary school; however, this did not materialize due to the absence of a designated mathematics teacher. The design and development of the instructional materials were therefore undertaken collaboratively by PhD and MST students, together with faculty members from the Department of Mathematics and Statistics serving as subject matter experts.

The development was anchored on the positive outcomes of a previous research initiative

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(Tandog & Verzosa, 2021), as well as on the initially developed LMs and the Professional Learning Community (PLC) structure for lesson study and pedagogical sharing established during the previous extension project (Tandog et al., 2022). The LMs prioritized the development of mathematical thinking and skills, with curriculum content serving primarily as a vehicle for cultivating the identified competencies. This approach seeks to address gaps in basic education, where instruction often tends to emphasize content coverage over the development of mathematical thinking and conceptual understanding.

The developed materials emerged from research lesson study conducted by the assigned groups and were guided by representation-based frameworks deemed appropriate by each group, including the Multiple Representation Approach (MRA), Concrete–Representational–Abstract (CRA), Representation Construction Approach (RCA), Concept Attainment (CA), and other related approaches, as shown in the following table.

Table 1. Mathematical thinking skills and content coverage of developed LMs.

Mathematical Thinking Skill	Content	Topics	Framework	Validation
Number Sense and Estimation	Numbers and Number Sense	-Number	- McKintosh/MRA	Complete
		-Operations (Multiplication)	-Array Models	(on-going)
		-Fractions	-RCA	Complete
Proportional Reasoning		-Percents	-Proportional Thinking	Complete
Relational Thinking	Sets	-Sets and Set Operations	-RCA -CA	Complete
Data Sense Making/ Quanti-tative Reasoning	-Descriptive Statistics	-Data Presentation -Average & spread	Microlearning	Complete
Predicting/Induct ive Reasoning	Patterns and Sequences	-Number Sequence	Inductive Learning Model	Complete
		-Arithmetic/ Geometric Seq		(On-going)
Spatial Reasoning	Geometry	-Polygons	-CA -Van Heile -CRA	Complete
		-Areas and Perimeter		(On-going)
Logical Reasoning	Mathematical Logic	- Conditional Statements	-CRA -Van Heile	Complete
Probabilistic Thinking	Combinatoric s	-Counting Techniques	-CRA	Complete
		-Combination -Permutation	-CA -CRA	(On-going)
	Probability	-Simple Probability		(On-going)
Symbolic Thinking	Algebra	-Alg. Expressions		(On-going)
Problem Solving		-Linear Equation		(On-going)
Measuring	Measurement		-	(On-going)

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The initial review of the developed materials was conducted online, with PhD Mathematics Education students serving not only as reviewers but also as critics who provided suggestions for improvement. The validation process was conducted primarily face-to-face with faculty members from the Department of Mathematics and Statistics, who served as subject matter experts.

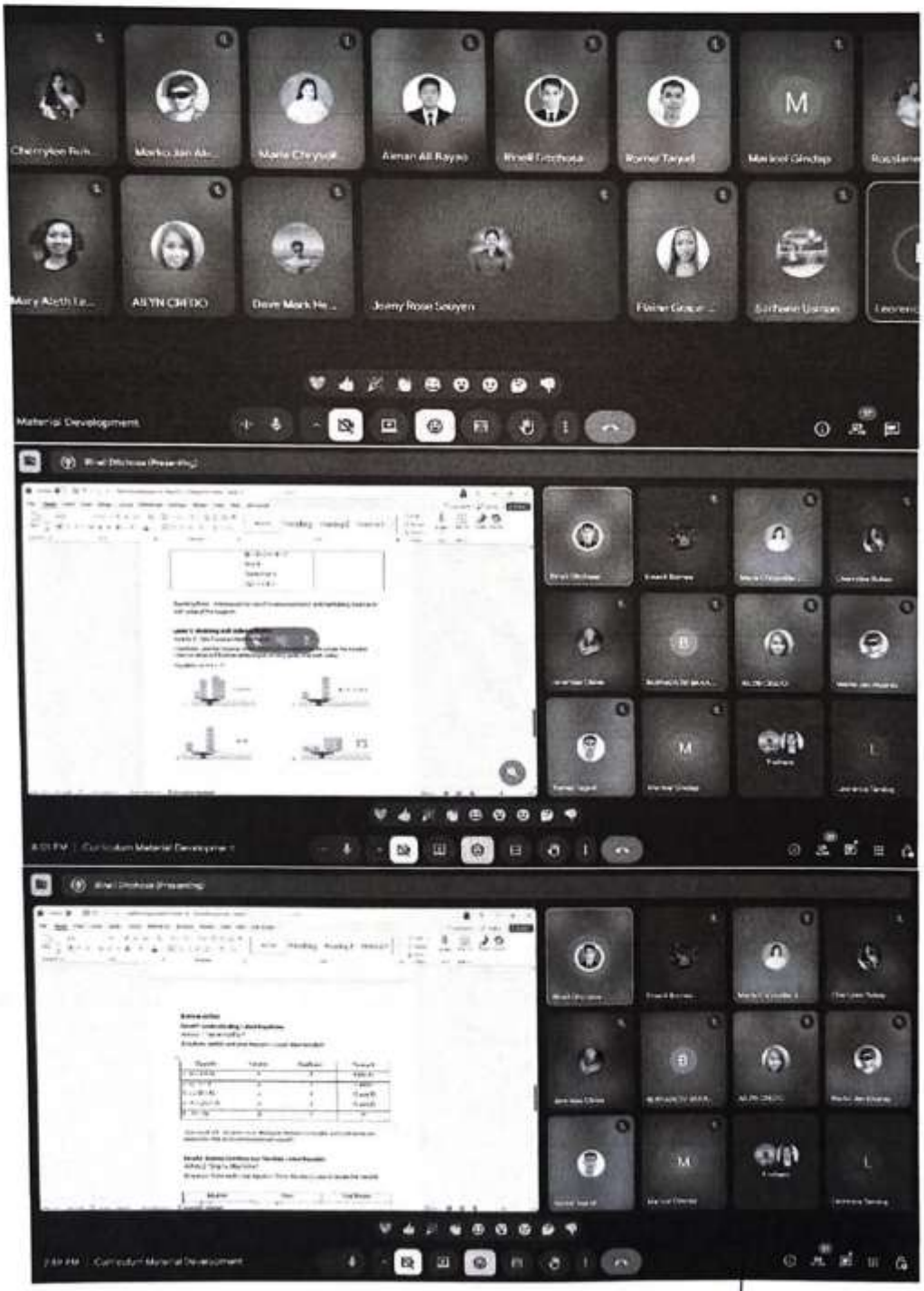


Figure 15. Online meetings and presentations of developed LMs

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The pilot testing of the developed LMs varied across groups. Some groups conducted pilot tests with students in their respective schools. Others selected a small number of students who shared similar characteristics with the target users to implement the materials and determine whether, after using them, the students were able to answer the intended pretest items. Revisions were made based on the results of these pilot tests.

For several groups, the initial implementation of the validated materials in the beneficiary school functioned as pilot testing, with revisions undertaken topic by topic. Adjustments were made including in the pacing of instruction and the number of activities assigned, based on how students interacted with the materials in the preceding lessons.

Implementation of LMs

After the preliminary arrangements and school visits, implementation commenced in mid-September 2026, with MST and PhD students taking the lead in deploying the (LMs) they had developed, under the guidance of faculty members from the Department of Mathematics and Statistics. The extension project team was allocated every Friday by the partner school for the implementation of the LMs.



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Figure 15. PhD Ed and MST math students during deployment and implementation of LMs

At the start of deployment, several student difficulties in using the materials were observed:

- Numbered instructions were interpreted as test items to be answered.
- Lettered examples were perceived as multiple-choice options to be encircled.
- Black-and-white printing rendered color-highlighted important texts unnoticeable.

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These observations indicated underlying issues in reading comprehension and test-taking habits. The LM writers suggested color printing to make important texts more noticeable. Adjustments in numbering and formatting were also considered. However, upon reflection, the original numbering and example formats were retained to address students' tendency to treat lettered items as multiple-choice options and to encircle answers mechanically



Figure 16. Extensionists Ensuring Student Safety During the October 10 Earthquake

The deployment of the learning materials was halted in November due to a land conflict in a nearby barangay and a killing incident on December 2, 2025, along the road leading to Salvacion. This decision was made to ensure that the safety of the graduate students and faculty members actively participating in the extension program was not compromised. As such many of the developed materials are still for implementation as shown in Table 2.



Figure 17. Newsclips of incidents that affected project implementation

Aside from the deployment of learning materials (LMs), a review in preparation for college admission examinations was conducted for senior high school students. The Department of Mathematics and Statistics provided review sessions on mathematics and quantitative reasoning, aiming to improve students' problem-solving skills and test-taking strategies. Other test components, such as English and Science, were delegated to the school as it has available teachers to handle these subjects. This collaborative effort provided a comprehensive review experience and helped enhance students' readiness and confidence for college admission examinations.

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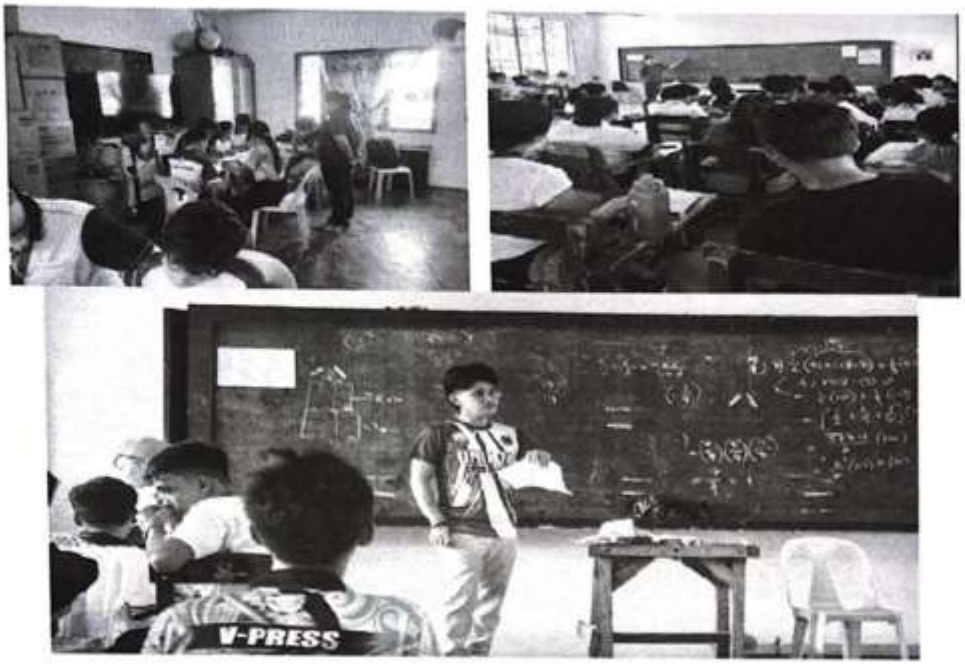


Figure 17. USM conducting a review for college admission tests

The school also requested assistance from the Mathematics and Statistics faculty extensionists in training selected students for the Damath competitions, further strengthening the collaboration between the university and the partner school while providing students with opportunities to develop their mathematical and strategic skills. This support helped enhance students' computational skills, and strategic decision-making, which are essential in mathematical problem-solving and competitive events.



Figure 17. USM coaching student contestants for DAMATH competition

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Outcomes of the Project

The targeted major outcome of this project is the enhancement of numerical literacy and mathematics performance and among barangay high school students through the implementation of the developed LMs

1. **Improved** overall performance of the target school and increase the chances of its senior high school (SHS) students being admitted to the University of Southern Mindanao (USM).
    - Improved numeracy

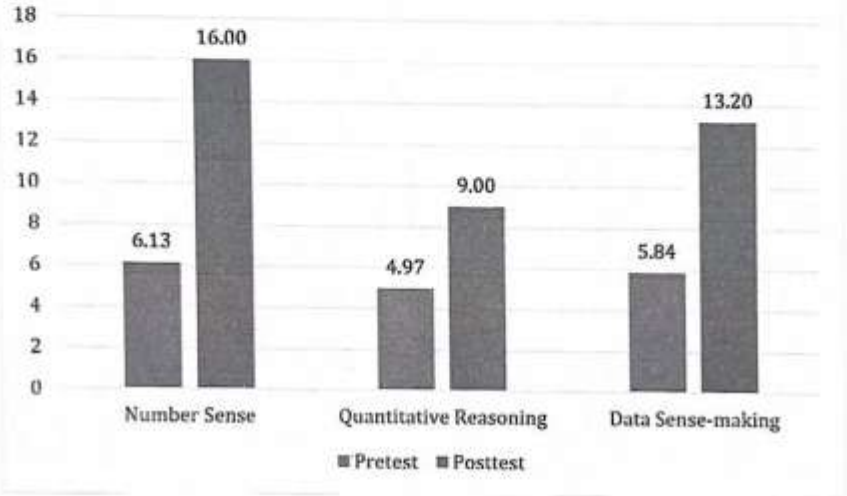
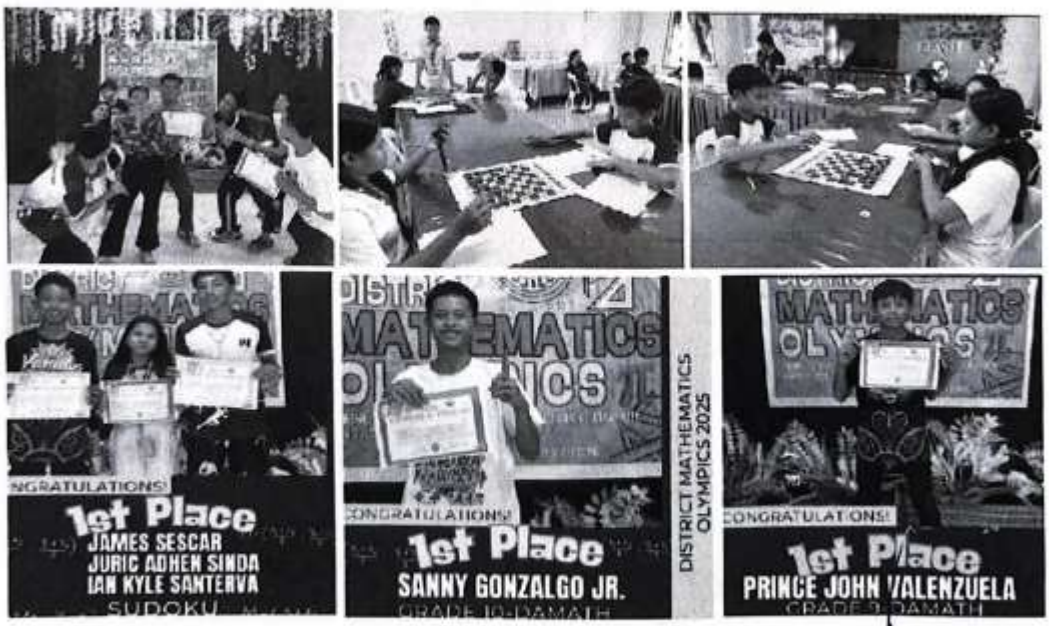


Figure 18. Pretest and Posttest performance of students

2. **Improved** ranking in mathematics competitions



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Extension Project Outputs

This project has produced the following outputs:

1. Developed and validated learning materials on at least ten topics
2. Three completed action research
3. One research article ready for journal publication submission



Improving Students' Quantitative Reasoning and Data Sense-Making through Microlearning-Based Gradual Release Scaffolding

Klaine Ramona Espiritu Lamata
Dave Mark A. Herrera
Bernadeth L. Bañagos
Lourence C. Tandog
University of Southern Mindanao

Abstract

Developing quantitative reasoning and data-sense making skills among students are two essential goals of statistics education. However, students face difficulties in understanding statistical concepts, choosing appropriate graphs for representing and organizing data and drawing conclusions. Microlearning was known for its effectiveness in enhancing retention and reducing cognitive load, but there is limited literature that examines its application in improving students' statistical skills. Moreover, the integration of the Gradual Release of Responsibility (GRR) model as a form of scaffolding in microlearning has not yet been fully explored. Hence, this study aimed to determine the effectiveness of microlearning based gradual release scaffolding in improving students' quantitative reasoning and data sense making. Using a one-group pretest and posttest design, 32 students from Salvacion High School answered a validated two-part test. Part I was a 20-item multiple choice test that measured their ability to understand and compute measures of central tendency and to read and interpret graphs. Part II measured their ability to construct graphs from a given set of data. Results revealed that after the two-week intervention using the researcher-made microlearning material, there was a significant difference in the pretest and posttest scores of students in quantitative reasoning and data sense making where both of their p-values were less than 0.01 and lower than the 0.05 level of significance. Moreover, it was found that the said instructional approach has a large effect in the improvement of students' quantitative reasoning (effect size r=0.63) and data sense making (effect size r=0.73). This implies that microlearning based gradual release scaffolding is effective in the development of students' ability to understand statistical concepts and to interpret and present data in graphs meaningfully. Researchers recommended conducting studies using larger samples, different grade levels and subject areas and investigating long-term retention to further validate its effectiveness.

Statistics provides tools and methods in everyday decision making. It enables people to see patterns, relationships and trends that are usually hidden in raw data. In the field of education, statistics is not only about computations but also about quantitative reasoning and data sense-making. Developing these skills are the two essential goals of statistics in mathematics education. Quantitative reasoning focuses on using mathematical concepts to logically reason quantities and relationships (Herbert & Pierce, 2023). In that sense, teachers encourage students to read, interpret, draw conclusions and make predictions in the collected data. On the other hand, data sense making involves interpreting, analyzing, and drawing conclusions in sets of data without using formal analytical tools as well as constructing different representations of data such as graphs and tables (Langrall et al., 2022; Estrella et al., 2021).

However, many students struggle with these skills due to difficulties in connecting mathematical procedures with conceptual understanding that limits their ability to apply statistics in real-life situations (Chan et al., 2019; Sadi and Sisa, 2019; Ng & Chew, 2023). In the Philippine educational context, assessments have shown that Filipino students continue to encounter difficulties in understanding statistical concepts, specifically using constructing and simplifying data, choosing appropriate graphs in representing and organizing data, drawing conclusions from graphing and tabular data and even solving and interpreting measures of central tendency (Paz, 2020; Jansen et al., 2023; Chang et al., 2024). Given the challenges faced by students, it is essential to explore different instructional strategies that can strengthen their skills in statistics and mathematics in general.

Microlearning has gained attention as a strategy that can improve engagement, retention and understanding by reducing cognitive overload and allowing learners to focus on specific objectives (Lai & Lee, 2016; Mostrady, 2025). Research suggests that students learn more effectively when complex concepts are broken down into smaller and manageable segments that allows them to process the information gradually (Dandel et al., 2017; Sathyaseelan et al., 2024). Supporting microlearning with gradual release of responsibility (GRR) as a form of scaffolding offers an effective instruction in improving students' quantitative reasoning and data sense-making. In this approach, students first observe interpretation of graphs and computational procedures, then complete partially guided tasks, and finally construct graphs or solve problems independently while making the content into short and manageable segments. This ensures that students are provided enough time to answer guided practice with feedback, and gradually releases responsibility as they develop independence in computing and

Figure 20. Research article from extension project for journal publication

CERTIFIED TRUE COPY:
MARGIE N. [illegible]TUAN-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date:_____

REFERENCES

De las Peñas M.L.A., & Bautista, D.M (2008). Understanding and developing proofs with the aid of technology. *Electronic Journal of Mathematics and Technology*, 2(3), 261-273.

Gutierrez, J., & Bilefsky, D. (2021). With schools closed, Covid-19 deepens a Philippine education crisis. Retrieved October 19, 2021, from https://www.nytimes.com/2021/09/13/world/asia/philippines-students-remote-covid.html

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Taka D., Taka A., & Budinski N. 2010. On visualization problems using the GeoGebra and Scientific Workplace packages. *International Journal for Technology in Mathematics Education 17(4)*

CERTIFIED TRUE COPY:
MARGIE N. [illegible]UTUAN-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date:_____

TO WHOM IT MAY CONCERN:

THIS IS TO CERTIFY that the extension project titled **"Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools (AY 2025-2026)"**, implemented by the University of Southern Mindanao at Salvacion High School, Matalam, Cotabato, has fully met and satisfied all the prescribed guidelines, standards, and requirements set forth under **JC3 CMO No. 18, Series of 2025.**

THIS IS FURTHER TO CERTIFY that, having successfully fulfilled the prerequisite monitoring and implementation compliance metrics under the aforementioned Joint Circular/CMO guidelines, the project was deemed **ELIGIBLE** for the conduct of the official Client Satisfaction Survey (CSS).

THIS LIKEWISE CERTIFIES that the **Terminal Report** for the project was officially completed, submitted, and duly received on time by the **Extension Services Office** in accordance with institutional schedules and project reporting timelines.

The project obtained a total of **87.2 points out of the maximum score of 100 points,** based on the results of the official Client Satisfaction Survey (CSS) conducted among the target beneficiaries.

Attached herewith is the official summary of the CSS Results conducted among the target beneficiaries.

GLYN B. GABANO-MAGBANUA

Director, Extension Services Office

CERTIFIED TRUE COPY:

MARGIE N. [illegible]TUAN-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date:_____

OUTCOME/S

O.1. The Extension Program is well-planned, implemented, monitored, evaluated and disseminated.

2023 Extension Project

1. Needs Assessment

Result of Needs Assessment

During our visit to Nangaan Elementary School to conduct a needs assessment, several needs were identified among the educators:

1. They need more materials to help teach fractions better.
2. They want easier ways to explain fractions to students.
3. They think it's important to use the students' own language and culture when teaching math.
4. Teachers want training to improve how they teach math, especially fractions.
5. They believe sharing ideas and materials with other teachers is important for improving teaching.

Prepared by:

SANDRA A. NANDING
Component Leader

Noted by:

PHILIP LESTER P. BENJAMIN, PhD
Project Leader

2. Detailed Proposal

University of Southern Mindanao

EXTENSION SERVICES OFFICE

Kabacan, North Cotabato

DETAILED PROPOSAL

A. BASIC INFORMATION

1. **Title of the Project:** Strengthening mother-tongue based education of elementary teachers in DepEd Cotabato/MBHTE BARMM through instructional materials development and validation.
2. **Proponents(s)**

Component 1: Development of high-quality mother-tongue based instructional materials in elementary mathematics that effectively engage and educate students.

2.1 Name: PHILIP LESTER P. BENJAMIN
2.2 Designation: Component 1 Leader
2.3 Component 1 members: Leorence Tandog, Debbie Marie Verzosa, Florie Jane Tamon, Rowel Madio, Roel Valenton, Anna Jean Garcia, Leonard Paleta
2.4 College/ Unit: Graduate School/College of Science and Mathematics
2.5 Address: Osias, Kabacan, Cotabato
2.6 Telephone Number (s): 09338245352
2.7 Fax Number: none
2.8 Email Address: plbenj@usm.edu.ph

Component 2: Validation of mother-tongue based instructional materials developed for elementary mathematics through feedback from teachers, students, and parents.

2.9 Name: SANDRA A. NANDING
2.10 Designation: Component 2 Leader

2.11 Component 2 members: Merian Rubio, Jeaneth Licaros, Daryl Mae Mamon, Jonald Pimentel, Jennifer Pama, Honey Vincent Valle

2.12 College/ Unit: College of Science and Mathematics

2.13 Address: Mercado Street, Kabacan, Cotabato

2.14 Telephone Number (s): 09169284643

2.15 Fax Number: none

2.16 Email Address: nsnanding@usm.edu.ph

3. **Implementing Agency**
   a. Lead Agency: USM Graduate School/College of Science and Mathematics
   b. Collaborating Agency (s): Deped Cotabato/MBHTE BARMM
4. **Project Duration:** One year
5. **Project Location:** Cotabato/BARMM
6. **Total Budget Requirement**

   6.1. Budget Requested: P60,000

   6.2. Agency Counterpart

B. TECHNICAL DESCRIPTION

1. **Rationale**

The United Nations has declared the period between 2022 and 2032 as the International Decade of Indigenous Languages to bring attention to the endangered status of many indigenous languages and to mobilize resources for their preservation, revitalization, and promotion. In the Philippines, Republic Act No. 10533, known as the Basic Education Act, emphasizes the importance of using languages understood by learners, and the curriculum is based on the principles of Mother Tongue-Based Multilingual Education. The Department of Education also promotes the use of indigenous languages through its Indigenous Peoples Education Program, but requires a working orthography, primer guide to literacy, vocabulary in various domains, a grammar sketch, and learning materials before it can be officially recognized and used as a medium of instruction in schools.

Additionally, the Department of Education also provides training to teachers to effectively teach in an indigenous language and provide support for the development of instructional materials. The use of indigenous languages in education has been shown to be effective in improving learning outcomes, particularly in reading and writing, and in promoting cultural identity and self-esteem among indigenous learners.

However, the implementation of these programs faces challenges such as lack of resources and expertise in developing materials and training teachers in indigenous languages. It is important that the government and other stakeholders continue to invest in and support the preservation, revitalization, and promotion of indigenous languages to ensure their survival and to empower indigenous communities.

It is also important to engage with the indigenous communities and involve them in the development and implementation of programs related to their languages. This includes consulting with them on the development of orthography, primer guides, vocabulary, grammar sketches and learning materials, as well as involving them in teacher training and curriculum development.

Furthermore, promoting and preserving indigenous languages should not be limited to education, it should be integrated in all aspects of life. The government and other stakeholders should also promote the use of indigenous languages in media, government services, and other areas of public life. This can be done by providing translation and interpretation services, creating media content in indigenous

languages, and encouraging the use of indigenous languages in government and other public service settings.

Overall, the International Decade of Indigenous Languages and the efforts of the Philippines government to promote the use of indigenous languages in education provide an opportunity to address the critical situation of many indigenous languages and to empower indigenous communities. However, it is important to sustain these efforts and to involve indigenous communities in the development and implementation of programs to ensure their success and long-term impact.

It's also worth noting that preserving indigenous languages is not only important for the communities that speak to them, but also for linguistic and cultural diversity as a whole. Indigenous languages often contain unique knowledge and perspectives that can contribute to the global understanding of history, culture, and the environment. Additionally, the loss of an indigenous language can also mean the loss of traditional practices, stories, and other cultural heritage that are passed down through generations.

Moreover, it is important to recognize that language preservation and revitalization is not a one-time effort, but a continuous process. It requires ongoing commitment and resources from government, organizations, and communities. This can include funding for language documentation and archiving, language revitalization programs and workshops, and community-based language programs. Furthermore, community-based language programs are particularly effective in revitalizing endangered languages as they are often led by local speakers and have community support.

In conclusion, preserving and promoting indigenous languages is a critical effort that requires the collaboration of government, organizations, and communities. It is essential to involve indigenous communities in the development and implementation of programs, provide ongoing support and resources, and recognize the importance of indigenous languages for linguistic and cultural diversity, and for the preservation of traditional practices and cultural heritage.

The rationale behind this extension project to strengthen mother-tongue based education through instructional materials development and capacity building for elementary teachers in the DepEd Cotabato Division is rooted in several key considerations:

1. Promoting linguistic and cultural diversity: The use of mother-tongue as the medium of instruction in the early years of education has been recognized as an effective way to promote linguistic and cultural diversity. By providing students with the opportunity to learn in their mother-tongue, the project can help to preserve and promote the linguistic and cultural heritage of the students in the DepEd Cotabato Division.

2. Improving student learning outcomes: Research has shown that students who learn in their mother-tongue have better academic outcomes compared to students who learn in a language that is not their mother-tongue. This project aims to improve student learning outcomes by providing students with instructional materials that are tailored to their linguistic and cultural background, and by building the capacity of teachers to effectively teach in the students' mother-tongue.

3. Addressing the needs of students: This project aims to address the specific language and cultural needs of students in the DepEd Cotabato Division by developing instructional materials that are tailored to their needs and by providing teacher training that is aligned with the curriculum and the needs of the students.

Overall, this extension project aims to enhance mother-tongue based education in the Deped Cotabato/MBHTE BARMM Division by providing students with instructional materials that are tailored to their linguistic and cultural background and by building the capacity of teachers to effectively teach in the students' mother-tongue. This can help to improve student learning outcomes and promote linguistic and cultural diversity in the region.

2. Objectives

General objective: To improve mother-tongue based education of elementary school teachers in Deped Cotabato/MBHTE BARMM by developing and validating instructional materials.

Specific objectives:

1. To develop high-quality mother-tongue based instructional materials in elementary mathematics that effectively engage and educate students.

2. To validate mother-tongue based instructional materials developed for elementary mathematics through data analysis and feedback from teachers, students, and parents.

At the end of the extension activity, it is expected that:

a. educational resources in mathematics are created that are tailored to the students' mother tongue, which will help to make learning more meaningful and effective. The materials will be developed are based on the curriculum and will be validated through testing and feedback from teachers and students.
b. validated instructional materials will be used to support classroom instruction and will be evaluated for their effectiveness in improving student learning outcomes.

3. Methodology

The methodology for implementing this project will be divided into three main phases: development, implementation, and evaluation.

Pre-implementation/Development Phase (Social Preparation):

✓ Finalization of methodology, ethics, and permission protocols, MOA
✓ Conduct profiling or needs assessment within DepEd Cotabato/MBHTE BARMM to identify the specific language and cultural context of the students.

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

Implementation Phase:

- ✓ Develop and refine existing instructional materials based on the curriculum and the identified needs of the teachers.
- ✓ Validate the instructional materials through pilot testing with teachers, students, and parents.

To do this, we have the following.

PRE-IMPLEMENTATION/Development Phase:

a. Methodology, ethics, MOA, and permission protocols will be finalized.
   Ethics:
   - Obtain informed consent from participants.
   - Ensure confidentiality and anonymity of participants.
   - Follow ethical principles and guidelines for research involving human subjects.

   Permission protocols:
   - Obtain necessary permissions and approvals from relevant authorities such as DepEd Cotabato/MBHTE BARMM and the school where the extension project will be implemented.
   - Establish a Memorandum of Agreement (MOA) outlining the roles and responsibilities of all parties involved in the project.

b. Needs assessment
   A profiling or needs assessment will be conducted to identify the specific language and cultural context of the students, which can be used in the development of materials that are tailored to their needs. A needs assessment will also be conducted to identify the main difficulties in students in learning math. This will be done through surveys, informal interviews, or online meetings.

IMPLEMENTATION Phase

a. Develop and refine existing instructional materials based on the curriculum and the identified needs of the teachers.

i. Curriculum Alignment: A thorough review of the elementary mathematics curriculum and standards will be conducted to ensure that the instructional materials align with the curriculum. Additionally, the identified needs of the teachers will be taken into consideration during the development and refinement process.

ii. Materials Development: A team of experts in mathematics education and instructional design will be assembled to develop the instructional materials.

iii. Review and Feedback: The instructional materials will be reviewed by the team and feedback will be solicited from teachers and other experts in the field to ensure that the materials are of high quality and effectively meet the needs of the students.

iv. Revisions: Based on the feedback received, revisions will be made to the instructional materials as necessary. This will ensure that the materials are accurate, up-to-date, and aligned with the curriculum.

v. Formatting and Production: The instructional materials will be formatted and produced in a professional manner, using appropriate design and layout techniques to make them visually appealing and easy to use.

vi. Quality Control: Quality control measures will be in place to ensure that the instructional materials are free of errors and meet the standards of excellence.

vii. Pilot Testing: The instructional materials will be pilot tested with a small group of teachers, students, and parents to assess their effectiveness and gather feedback for revisions.

viii. Revisions and Improvements: Based on the feedback, revisions and improvements will be made to the instructional materials as necessary.

b. Validate the instructional materials through pilot testing with teachers, students, and parents.

i. Selection of Pilot Testing Participants: A representative sample of teachers, students, and parents will be selected to participate in the pilot testing of the instructional materials. This sample will be chosen based on the specific language and cultural context of the students and the needs of the teachers.

ii. Preparation: The pilot testing participants will be provided with an overview of the instructional materials.

iii. Data Collection: Data will be collected through a variety of methods such as observation,

interviews, surveys, and assessments. The data will be collected from teachers, students, and parents.

iv. Feedback and Revisions: Feedback from the pilot testing participants will be used to make revisions and improvements to the instructional materials as necessary.

4. Revision and writing the final form

An online meeting will be regularly scheduled between USM extensionists, and DepEd Cotabato/MBHTE BARMM teachers/representatives to discuss revisions of supplementary materials of topics which are about to be covered in DepEd regular schedule. The materials will be written in manner that can be best understood by the students.

5. The extension project will produce refined versions of supplementary materials in coordination with DepEd Cotabato/MBHTE BARMM teachers, students, and parents.

6. The process will continue until supplementary materials of good quality is produced and uploaded in the page. Enhanced quality of learning in the basic education is expected from this extension project. This project targets wide subscription of teachers.

VALUES EDUCATION/REORIENTATION

Values education and re-orientation can be an important aspect of this extension project to strengthen mother-tongue based education through instructional materials development and capacity building for elementary teachers in the DepEd Cotabato Division.

Values education can be incorporated into the instructional materials and teacher training program to help students develop positive attitudes, beliefs, and behaviors that align with the school's mission and vision. This could include topics such as respect, responsibility, honesty, and cooperation.

Re-orientation can be an important aspect of the project, as it can help to shift the focus of education from a traditional emphasis on rote learning to a more holistic approach that prioritizes the development of critical thinking, problem-solving, and communication skills. This can be achieved through the development of instructional materials that are aligned with the needs of the students and the curriculum and by providing teacher training that focuses on effective teaching strategies, assessment, and curriculum development.

Additionally, involving community members and other relevant stakeholders in the project can help to promote a shared understanding of the importance of mother-tongue based education and the role it plays in preserving linguistic and cultural diversity. This can help to build support for the project and ensure that it is sustainable in the long term.

REPORT WRITING

The final report will have the following methodology.

i. Data Collection: Gather all the data collected during the project including feedback from participants, and any other relevant information.

ii. Report Outline: Develop a clear and concise outline for the report, including the introduction, methodology, results, discussion, conclusion, and recommendations sections.

iii. Writing the Report: Write the report in a clear and concise manner, using appropriate language and formatting. Use tables, figures, and appendices as needed to present the data and results effectively.

iv. Review and Editing: Review the report multiple times to ensure that it is free of errors and that the information is presented clearly and accurately. Have others review the report for feedback and make revisions as necessary.

v. Final Review: Conduct a final review of the report to ensure that all the necessary information is included and that the report is ready for submission.

7. Work Plan

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Pre-Implementation												
Finalization of methodology, ethics, and permission protocols, MOA												

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

Conduct profiling or needs assessment												
IMPLEMENTATION												
Development and refining of existing IMs												
Validation of the instructional materials												
REPORT WRITING												
Writing the final report												

Results Framework

Outputs	Outcome	Impact
Developed and validated mathematics instructional materials for mother-tongue based education.	Improved proficiency in the mother tongue among students. Increased use of mother-tongue as a medium of instruction in mathematics classrooms.	Improved mathematics academic performance and learning outcomes for students. Increased cultural pride and self-esteem among students. Stronger linguistic and cultural identity among students. Improved quality of education in the area.

2. Notice to Proceed and Approval Sheet

Tel. No. (064) 572-2638
e-mail address: vprde@usm.edu.ph

CERTIFIED www.bsv.com ID 9100634167

OFFICE OF THE VICE PRESIDENT FOR RESEARCH, DEVELOPMENT AND EXTENSION

UNIVERSITY RESEARCH DEVELOPMENT & EXTENSION COMMITTEE

APPROVAL SHEET

I. **BASIC INFORMATION**

URDEC No.:_____
___ Program
___ Project
___ Study
___ Others

Project Title: Strengthening mother-tongue based education of elementary teachers in Dep-Ed Cotabato/MBHTE BARMM through instructional materials development and validation

Project Leader:	Philip Lester Benjamin
Duration/ Period of Conduct:	January 2023- December 2023
Implementing Agency/Unit:	USM
Location/Research Station:	USM
Budget Detail:	P60,000.00 (Extension Fund-05)

II. ACTION TAKEN: ☑ Approved ☐ Disapproved Remarks: _____

Date of Implementation: January - December 2023

RESEARCH REVIEW COMMITTEE

LYDIA C. PASCUAL
Director, RDO

ABUBAKAR A. MURRAY
Director, PICRI

EFREN E. MAGULAMA
Director, USMARC

MARY JOY B. CAÑOLAS
Director, ESO

DEBBIE MARIE B. VERZOSA
Director, RPSO

_____
Statistical Pool

Approved by:

MA. TEODORA N. CABASAN
VP for RDE

II. REVIEWED BY: Date Jan. 20, 2023 Remarks
Statistical Pool _____

III. FOR ISSUANCE OF:

___✓___ Notice to Proceed
___✓___ Special Order
_____ Research Contract
_____ Policy Guidelines (IPR, PNS, IACUC Permit, others _____)

IV. OUTPUTS:

_____ Progress Report (Quarterly)
_____ Financial Report
_____ Completion Report
_____ Last Quarter Honorarium released upon submission of terminal/publishable article
_____ Terminal Report/Publishable Article Submitted

Recorded by: _____

USM-RES-F24-Rev.1.2020.02.18

CERTIFIED TRUE COPY:
MARGIE N. BUTUAN-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date: _____

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

NOTICE TO PROCEED

NTP #: 2023-E009
January 26, 2023

PROF. PHILIP LESTER P. BENJAMIN
University of Southern Mindanao
Kabacan, Cotabato

Dear PROF. BENJAMIN,

Your extension project proposal had been approved by the URDEC for 2023 funding in the amount of Php 60,000.00 (Extension Fund-05) allocation. Notice is hereby given that the conduct of the project/study entitled **"Strengthening mother-tongue based education of elementary teachers in Dep-Ed Cotabato/MBHTE BARMM through instructional materials development and validation"** may commence not later than 7 days after the receipt of this notice up to December 2023.

As Project Leader, you shall be responsible for ensuring the completion of the extension project in accordance with the approved work and financial plan. Furthermore, you have to submit a quarterly progress report and news feature article about your activities. Make oral presentation during the University Research, Development and Extension In-House Reviews. Upon completion of the project, you have to submit six (6) copies of the terminal report not later than March 2024. Acknowledge ESO in all reports, articles and media releases related to the project. By virtue of this designation, you shall be entitled to corresponding honorarium subject to existing laws or policy on this matter.

In the event that you discontinue the extension project without justifiable reasons or deliberately avoid your responsibilities stated above, you have to refund/return to the management the total amount you have actually spent.

Please acknowledge receipt and acceptance of this NOTICE by signing both copies in the space provided below.

Very truly yours,

MARY JOY S. CAÑOLAS, PhD
Director for Extension

Recommending approval:

MA. TEODORA N. CABASAN, PhD
Vice Pres. for Res., Dev't. & Ext'n. and
Vice-Chairman, URDEC

Approved by:

FRANCISCO G. N. GARCIA, PhD
SUC President IV, USM and
Chairman, URDEC

Conforme:

PHILIP LESTER P. BENJAMIN
Project Leader

CERTIFIED TRUE COPY:
MARGIE N. [illegible]TUAN-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date:_____

3. Special Order

Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Tel No. 63 (64) 572 - 2138
email address: op@usm.edu.ph
OFFICE OF THE PRESIDENT

Special Order No. 209
Series of 2023

TO: **DR. PHILIP LESTER P. BENJAMIN**

SUBJECT: **Designation as PROJECT LEADER of the project entitled, "Strengthening mother-tongue based education of elementary teachers in Dep-Ed Cotabato/MBHT BARMM through Instructional Materials"**

DATE: **Tuesday, April 25, 2023**

In the exigency of the service and pursuant to the policy of harnessing the capabilities of faculty member/employee in managing the affairs of the University, you are hereby designated as **PROJECT LEADER of the project entitled, "Strengthening mother-tongue based education of elementary teachers in Dep-Ed Cotabato/MBHT BARMM through Instructional Materials"** being implemented by the University of Southern Mindanao, in addition to your appointive position, for the period January 2023 until December 2023.

As Project Leader, you are expected to perform the following functions:

1. Conduct needs assessment;
2. Develop instructional materials;
3. Submit quarterly progress reports using monitoring/accomplishment report form;
4. Submit news feature article about the project;
5. Make oral presentation during the midyear and yearend RDE In-house Review;
6. Submit copies of terminal reports.

As such, you shall integrate in your IPCR the following success indicator specific for this project aside from other projects handled.

a. implements extension project on schedule and with appropriate fund utilization.

5-11-20

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Tel No. 63 (64) 572 - 2138
email address: op@usm.edu.ph
OFFICE OF THE PRESIDENT

Special Order No. 211
Series of 2023

TO: **MS. SANDRA A. NANDING**

SUBJECT: **Designation as COMPONENT LEADER of the component2, "Validation of mother-tongue based instructional materials developed for elementary mathematics through feedback from teachers, students, and parents"**

DATE: **Tuesday, April 25, 2023**

In the exigency of the service and pursuant to the policy of harnessing the capabilities of faculty member/employee in managing the affairs of the University, you are hereby designated as **COMPONENT LEADER of the component2, "Validation of mother-tongue based instructional materials developed for elementary mathematics through feedback from teachers, students, and parents"** being implemented by the University of Southern Mindanao, in addition to your appointive position, for the period January 2023 until December 2023.

As Component Leader, you are expected to perform the following functions:

1. Conduct needs assessment;
2. Conduct validation of develop instructional materials;
3. Submit quarterly progress reports using monitoring/accomplishment report form;
4. Submit news feature article about the project.

As such, you shall integrate in your IPCR the following success indicator specific for this project aside from other projects handled.

a. implements extension project on schedule and with appropriate fund utilization.

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

4. Budget

University of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

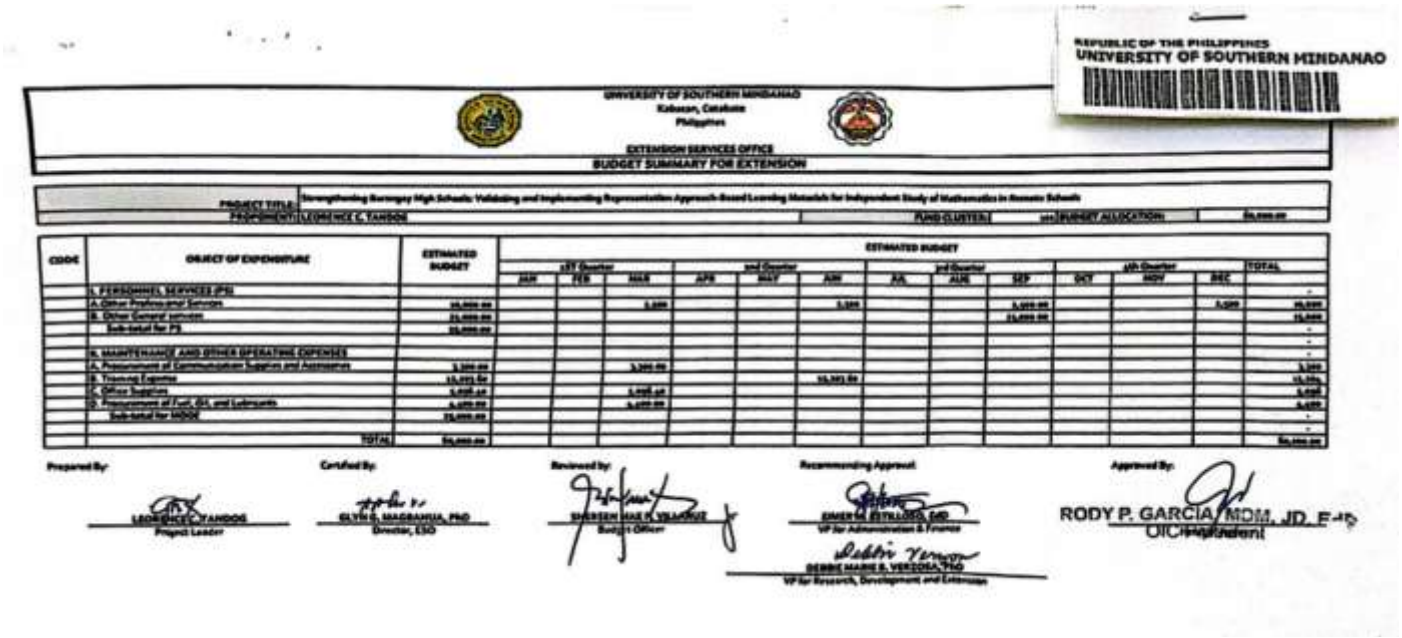
BUDGET SUMMARY

Project Title: Strengthening mother-tongue based education of elementary teachers in Deped Cotabato/MBHTE BARMM through instructional materials development and validation.

Proponents: Philip Lester P. Benjamin

Source of Fund: Extension Fund 05	Total Budget: Php60,000		Implementing College/Unit: CSM		
ITEM	Year 1				Total
	Q1	Q2	Q3	Q4	
I. Other Supplies and Materials Expenses-Common					
A. Consumables: Epson inks			958.76	479.38	1,438.14
Sub-total			958.76	479.38	**1,438.14**
II. Food Supplies					
A. Meals			18,750.00		18,750.00
Sub-total			18,750.00		**18,750.00**
III. Fuel Expenses					
A. Gasoline			6,750.00		6,750.00
Sub-total			6,750.00		**6,750.00**
III. Communication					
A. Cell Cards (Smart)	1000	1000	1000		3,000.00
Sub-total	1000	1000	1000		**3,000.00**
IV. Other Professional Services					
Instructional materials illustrator		20,000			20,000.00
Honorarium	2,500	2,500	2,500	2,500	10,000.00
Sub-total	2,500	22,500	2,500	2,500	**30,000.00**
TOTAL	3500	23,500	29,958.76	2,978.38	**P59,938.14**
	35	235	299.5876	29.7838	399.3814

XT-F03-Rev.3.2021.01.26



5. Quarterly Accomplishment Report

University of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

MONITORING/ ACCOMPLISHMENT REPORT
for the 1st Quarter, C.Y. 2023

Project Title: Strengthening Mother-tongue based Education of Elementary Teachers in DepEd Cotabato/MBHTE BARMM through Development and Validation of Instructional Materials for Elementary Mathematics

Proponent/s: Philip Lester Benjamin, Sandra Nanding, Leorence Tandog, Debbie Marie Verzosa, Florie Jane Tamon, Rowel Madio, Roel Valenton, Anna Jean Garcia, Leonard Paleta, Meriam Rubio, Jeaneth Licaros, Daryl Mae Mamon, Jonald Pimentel, Jennifer Pama, Honey Vincent Valle

College/Unit: Graduate School/College of Science and Mathematics | **Budget Utilization to date: (%)**

ACTIVITIES	Accomplishment		% Completion (Cumulative)	Problem/s Encountered	Action/s Taken	Remarks/ Recommendations
	Target	Actual				
Obtain necessary permissions and approvals from relevant authorities	10%	100%	10%	None	None	
Conduct profiling and needs assessment	20%	100%	30%	None	None	

Prepared by:

PHILIP LESTER P. BENJAMIN
Project Leader
April 7, 2023
Date

Noted by:

LEORENCE C. TANDOG
College/Unit Head
April 10, 2023
Date

MARY JOY S. CAÑOLAS
Director for Extension Services
April 10, 2023
Date

USM-EXT-F07-Rev.3.2021.01.26

University of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

MONITORING/ ACCOMPLISHMENT REPORT
for the 2nd Quarter, C.Y. 2023

Project Title: Strengthening Mother-tongue based Education of Elementary Teachers in DepEd Cotabato/MBHTE BARMM through Development and Validation of Instructional Materials for Elementary Mathematics

Proponent/s: Philip Lester Benjamin, Sandra Nanding, Leorence Tandog, Debbie Marie Verzosa, Florie Jane Tamon, Rowel Madio, Roel Valenton, Anna Jean Garcia, Leonard Paleta, Meriam Rubio, Jeaneth Licaros, Daryl Mae Mamon, Jonald Pimentel, Jennifer Pama, Honey Vincent Valle

College/Unit: Graduate School/College of Science and Mathematics | **Budget Utilization to date: (%)**

ACTIVITIES	Accomplishment		% Completion (Cumulative)	Problem/s Encountered	Action/s Taken	Remarks/ Recommendations
	Target	Actual				
% Completion 1st Quarter			30%			
Development and refining of existing IMs	25%	100%	55%	None	None	

Prepared by:

PHILIP LESTER P. BENJAMIN
Project Leader
July 3, 2023
Date

Noted by:

LEORENCE C. TANDOG
College/Unit Head
July 3, 2023
Date

MARY JOY S. CAÑOLAS
Director for Extension Services
July 5, 2023
Date

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

University of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

MONITORING/ ACCOMPLISHMENT REPORT

for the 3rd Quarter, C.Y. 2023

Project Title: Strengthening Mother-tongue based Education of Elementary Teachers in DepEd Cotabato/MBHTE BARMM through Development and Validation of Instructional Materials for Elementary Mathematics

Proponent/s: Philip Lester Benjamin, Sandra Nanding, Leorence Tandog, Debbie Marie Verzosa, Florie Jane Tamon, Rowel Madio, Roel Valenton, Anna Jean Garcia, Leonard Paleta, Meriam Rubio, Jeaneth Licaros, Daryl Mae Mamon, Jonald Pimentel, Jennifer Pama, Honey Vincent Valle

College/Unit: Graduate School/College of Science and Mathematics | **Budget Utilization to date: (%)**

ACTIVITIES	Accomplishment		% Completion (Cumulative)	Problem/s Encountered	Action/s Taken	Remarks/ Recommendations
	Target	Actual				
% Completion 2nd Quarter			55%			
Validation of the instructional materials	25%	0%	55%	Unable to proceed due to scheduling conflict	Identified scheduling conflict and attempted to reschedule	

Prepared by:

PHILIP LESTER P. BENJAMIN
Project Leader
September 11, 2023
Date

Noted by:

LEORENCE C. TANDOG
College/Unit Head
September 11, 2023
Date

MARY JOY S. CAÑOLAS
Director for Extension Services
September 14, 2023
Date

University of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

MONITORING/ ACCOMPLISHMENT REPORT

for the 4th Quarter, C.Y. 2023

Project Title: Strengthening Mother-tongue based Education of Elementary Teachers in DepEd Cotabato/MBHTE BARMM through Development and Validation of Instructional Materials for Elementary Mathematics

Proponent/s: Philip Lester Benjamin, Sandra Nanding, Leorence Tandog, Debbie Marie Verzosa, Florie Jane Tamon, Rowel Madio, Roel Valenton, Anna Jean Garcia, Leonard Paleta, Meriam Rubio, Jeaneth Licaros, Daryl Mae Mamon, Jonald Pimentel, Jennifer Pama, Honey Vincent Valle

College/Unit: Graduate School/College of Science and Mathematics | **Budget Utilization to date: (%)**

ACTIVITIES	Accomplishment		% Completion (Cumulative)	Problem/s Encountered	Action/s Taken	Remarks/ Recommendations
	Target	Actual				
% Completion 3rd Quarter			55%			
Validation of the instructional materials	25%	100%	80%	None	None	
Report Writing	20%	100%	100%	None	None	

Prepared by:

PHILIP LESTER P. BENJAMIN
Project Leader
December 18, 2023
Date

Noted by:

LEORENCE C. TANDOG
College/Unit Head
December 18, 2023
Date

MARY JOY S. CAÑOLAS
Director for Extension Services
December 21, 2023
Date

6. Midyear/Year-end report

STRENGTHENING MOTHER-TONGUE BASED EDUCATION OF ELEMENTARY TEACHERS IN DEPED COTABATO/MBHTE BARMM THROUGH INSTRUCTIONAL MATERIALS DEVELOPMENT AND VALIDATION

PHILIP LESTER P. BENJAMIN, Ph.D.
Project Team Leader

SANDRA A. NANDING
Component 2 Leader

Funded by:

University of Southern Mindanao

Midyear In-House Review
July 2023

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato

ABSTRACT

STRENGTHENING MOTHER-TONGUE BASED EDUCATION OF ELEMENTARY TEACHERS IN DEPED COTABATO/MBHTE BARMM THROUGH INSTRUCTIONAL MATERIALS DEVELOPMENT AND VALIDATION
Project members: *Philip Lester P. Benjamin Ph.D. and Sandra A. Nanding*

Abstract. This extension project aims to strengthen mother-tongue based education in the DepEd Cotabato Division by focusing on instructional materials development and capacity building for elementary teachers. The project is motivated by several key considerations, including the promotion of linguistic and cultural diversity, improvement of student learning outcomes, and addressing the specific needs of students. By using the mother-tongue as the medium of instruction in the early years of education, the project aims to preserve and promote the linguistic and cultural heritage of students in the DepEd Cotabato Division. Research indicates that students who learn in their mother-tongue achieve better academic outcomes, and therefore, this project seeks to enhance student learning outcomes by providing tailored instructional materials that align with their linguistic and cultural background. Additionally, the project aims to build the capacity of teachers to effectively teach in the students' mother-tongue. To achieve its objectives, the project will develop high-quality instructional materials specifically for elementary mathematics. These materials will be designed to engage and educate students effectively. The developed materials will then undergo validation through data analysis and feedback from teachers, students, and parents. This validation process ensures that the materials are aligned with the curriculum and meet the needs of the students. Ultimately, this extension project strives to enhance mother-tongue based education in the DepEd Cotabato Division by providing customized instructional materials and improving the capacity of teachers. By doing so, the project aims to improve student learning outcomes and promote linguistic and cultural diversity in the region.

Keywords: Mother-tongue based education, instructional materials development, elementary teachers, DepEd Cotabato Division, instructional materials validation

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Philippines

NARRATIVE REPORT

A. BASIC INFORMATION		
1. Title	Strengthening Mother-tongue based Education of Elementary Teachers in DepEd Cotabato through Instructional Materials Development and Validation	
2. Status	☒ Ongoing ☐ Completed	
3. Project Leader Study Leader (Indicate College/Unit)	**Philip Lester P. Benjamin, Ph.D.** **Sandra A. Nanding** College of Science and Mathematics	
Email Address	pibenj@usm.edu.ph	
Contact Number	09338245352	
4. Lead Unit/College	**USM Graduate School/ College of Science and Mathematics**	
Collaborating Unit/College	**DepEd Cotabato**	
5. Category	☐ Program ☒ Project ☐ Study	
6. Classification	☐ Research	☐ Development ☒ Extension
	☐ Basic ☐ Applied	☐ Pilot Testing ☐ Prototype Development ☐ Tech. Promotion/Commercialization
7. Thematic Area	☒ Quality Learning, Skills Development, and Literacy ☒ Social Development, and Strong Institutions ☒ Preservation of Culture ☐ Environmental Protection, Conservation, and Risk Reduction ☐ Food Security and Poverty Reduction ☐ Good Health and Well-being ☐ Innovations in Science, Engineering, and Technology ☐ Sustainable Entrepreneurship and Management	
8. Project Duration	**One year**	
9. Project Location	Cotabato	
10. Total Budget Requested (Php)	60,000	

B. TECHNICAL DESCRIPTION

1. **Rationale / Significance**

Rationale

The United Nations has declared the period between 2022 and 2032 as the International Decade of Indigenous Languages to bring attention to the endangered status of many indigenous languages and to mobilize resources for their preservation, revitalization, and promotion. In the Philippines, Republic Act No. 10533, known as the Basic Education Act, emphasizes the importance of using languages understood by learners, and the curriculum is based on the principles of Mother Tongue-Based Multilingual Education. The Department of Education also promotes the use of indigenous languages through its Indigenous Peoples Education Program, but requires a working orthography, primer guide to literacy, vocabulary in various domains, a grammar sketch, and learning materials before it can be officially recognized and used as a medium of instruction in schools.

Additionally, the Department of Education also provides training to teachers to effectively teach in an indigenous language and provide support for the development of instructional materials. The use of indigenous languages in education has been shown to be effective in improving learning outcomes, particularly in reading and writing, and in promoting cultural identity and self-esteem among indigenous learners.

However, the implementation of these programs faces challenges such as lack of resources and expertise in developing materials and training teachers in indigenous languages. It is important that the government and other stakeholders continue to invest in and support the preservation, revitalization, and promotion of indigenous languages to ensure their survival and to empower indigenous communities.

It is also important to engage with the indigenous communities and involve them in the development and implementation of programs related to their languages. This includes consulting with them on the development of orthography, primer guides, vocabulary, grammar sketches and learning materials, as well as involving them in teacher training and curriculum development.

Furthermore, promoting and preserving indigenous languages should not be limited to education, it should be integrated in all aspects of life. The government and other stakeholders should also promote the use of indigenous languages in media, government services, and other areas of public life. This can be done by providing translation and interpretation services, creating media content in indigenous languages, and encouraging the use of indigenous languages in government and other public service settings.

Overall, the International Decade of Indigenous Languages and the efforts of the Philippines government to promote the use of indigenous languages in education provide an opportunity to address the critical situation of many indigenous languages and to empower indigenous communities. However, it is important to sustain these efforts and to involve indigenous communities in the development and implementation of programs to ensure their success and long-term impact.

It's also worth noting that preserving indigenous languages is not only important for the communities that speak to them, but also for linguistic and cultural diversity as a whole. Indigenous languages often contain unique knowledge and perspectives that can contribute to the global understanding of history, culture, and the environment. Additionally, the loss of an indigenous

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

language can also mean the loss of traditional practices, stories, and other cultural heritage that are passed down through generations.

Moreover, it is important to recognize that language preservation and revitalization is not a one-time effort, but a continuous process. It requires ongoing commitment and resources from government, organizations, and communities. This can include funding for language documentation and archiving, language revitalization programs and workshops, and community-based language programs. Furthermore, community-based language programs are particularly effective in revitalizing endangered languages as they are often led by local speakers and have community support.

In conclusion, preserving and promoting indigenous languages is a critical effort that requires the collaboration of government, organizations, and communities. It is essential to involve indigenous communities in the development and implementation of programs, provide ongoing support and resources, and recognize the importance of indigenous languages for linguistic and cultural diversity, and for the preservation of traditional practices and cultural heritage.

The rationale behind this extension project to strengthen mother-tongue based education through instructional materials development and capacity building for elementary teachers in the DepEd Cotabato Division is rooted in several key considerations:

1. Promoting linguistic and cultural diversity: The use of mother-tongue as the medium of instruction in the early years of education has been recognized as an effective way to promote linguistic and cultural diversity. By providing students with the opportunity to learn in their mother-tongue, the project can help to preserve and promote the linguistic and cultural heritage of the students in the DepEd Cotabato Division.

2. Improving student learning outcomes: Research has shown that students who learn in their mother-tongue have better academic outcomes compared to students who learn in a language that is not their mother-tongue. This project aims to improve student learning outcomes by providing students with instructional materials that are tailored to their linguistic and cultural background, and by building the capacity of teachers to effectively teach in the students' mother-tongue.

3. Addressing the needs of students: This project aims to address the specific language and cultural needs of students in the DepEd Cotabato Division by developing instructional materials that are tailored to their needs and by providing teacher training that is aligned with the curriculum and the needs of the students.

Overall, this extension project aims to enhance mother-tongue based education in the DepEd Cotabato Division by providing students with instructional materials that are tailored to their linguistic and cultural background and by building the capacity of teachers to effectively teach in the students' mother-tongue. This can help to improve student learning outcomes and promote linguistic and cultural diversity in the region.

Objectives (State the General Objectives and Specific Objectives)

General objective:
To improve mother-tongue based education of elementary school teachers in DepEd Cotabato by developing and validating instructional materials.

Specific objectives:
1. To develop high-quality mother-tongue based instructional materials in elementary mathematics that effectively engage and educate students.
2. To validate mother-tongue based instructional materials developed for elementary mathematics through data analysis and feedback from teachers, students, and parents.

2. **Methodology**

The methodology for implementing this project will be divided into three main phases: development, implementation, and evaluation.

Pre-implementation/Development Phase (Social Preparation):

- ✓ Finalization of methodology, ethics, and permission protocols, MOA
- ✓ Conduct profiling or needs assessment within DepEd Cotabato to identify the specific language and cultural context of the students.

Implementation Phase:

- ✓ Develop and refine existing instructional materials based on the curriculum and the identified needs of the teachers.
- ✓ Validate the instructional materials through pilot testing with teachers, students, and parents.

To do this, we have the following.

PRE-IMPLEMENTATION/Development Phase:

a. Methodology, ethics, MOA, and permission protocols will be finalized.

Ethics:

- Obtain informed consent from participants.
- Ensure confidentiality and anonymity of participants.
- Follow ethical principles and guidelines for research involving human subjects.

Permission protocols:

- Obtain necessary permissions and approvals from relevant authorities such as DepEd Cotabato and the school where the extension project will be implemented.
- Establish a Memorandum of Agreement (MOA) outlining the roles and responsibilities of all parties involved in the project.

b. Needs assessment

A profiling or needs assessment will be conducted to identify the specific language and cultural context of the students, which can be used in the development of materials that are tailored to their needs. A needs assessment will also be conducted to identify the main difficulties in students in learning math. This will be done through surveys, informal interviews, or online meetings.

IMPLEMENTATION Phase

a. Develop and refine existing instructional materials based on the curriculum and the identified needs of the teachers.

i. Curriculum Alignment: A thorough review of the elementary mathematics curriculum and standards will be conducted to ensure that the instructional materials align with the curriculum. Additionally, the identified needs of the teachers will be taken into consideration during the development and refinement process.

ii. Materials Development: A team of experts in mathematics education and instructional design will be assembled to develop the instructional materials.

iii. Review and Feedback: The instructional materials will be reviewed by the team and feedback will be solicited from teachers and other experts in the field to ensure that the materials are of high quality and effectively meet the needs of the students.

iv. Revisions: Based on the feedback received, revisions will be made to the instructional materials as necessary. This will ensure that the materials are accurate, up-to-date, and aligned with the curriculum.

v. Formatting and Production: The instructional materials will be formatted and produced in a professional manner, using appropriate design and layout techniques to make them visually appealing and easy to use.

vi. Quality Control: Quality control measures will be in place to ensure that the instructional materials are free of errors and meet the standards of excellence.

vii. Pilot Testing: The instructional materials will be pilot tested with a small group of teachers, students, and parents to assess their effectiveness and gather feedback for revisions.

viii. Revisions and Improvements: Based on the feedback, revisions and improvements will be made to the instructional materials as necessary.

b. Validate the instructional materials through pilot testing with teachers, students, and parents.

i. Selection of Pilot Testing Participants: A representative sample of teachers, students, and parents will be selected to participate in the pilot testing of the instructional materials. This sample will be chosen based on the specific language and cultural context of the students and the needs of the teachers.

ii. Preparation: The pilot testing participants will be provided with an overview of the instructional materials.

iii. Data Collection: Data will be collected through a variety of methods such as observation, interviews, surveys, and assessments. The data will be collected from teachers, students, and parents.

iv. Feedback and Revisions: Feedback from the pilot testing participants will be used to make revisions and improvements to the instructional materials as necessary.

3. **Accomplishment**

In February 2023, we successfully initiated contact with a representative from the local elementary school and presented our extension project to her. Our proposal was well-received, and we provided them with a comprehensive copy of our project plan.

Over the following months, we collected all the necessary documents, including informed consent and permission to proceed. To streamline the process, we utilized an existing memorandum of agreement, ensuring compliance with established protocols.

In March 2023, we completed a thorough needs assessment, which revealed a significant requirement for additional support in mathematics for students belonging to the Maguindanaon tribe. Recognizing the importance of teaching in their mother tongue, we identified this as a key focus area for our project.

As of June 2023, we have made substantial progress in revising our existing learning materials. Our team is meticulously double-checking the content to ensure there are no major issues or discrepancies before the materials are finalized for release. This attention to detail guarantees the quality and effectiveness of the materials in achieving our project goals.

Overall, we have achieved significant milestones, including successful project approval, document collection, needs assessment completion, and material revision.

4. **References (in APA format)**

5. **Problems Met and Recommended Action**

6. **Budget Utilization**

Component	Allocation	Utilized	% Utilized

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

STRENGTHENING MOTHER-TONGUE BASED EDUCATION OF ELEMENTARY TEACHERS IN DEPED COTABATO/MBHTE BARMM THROUGH DEVELOPMENT AND VALIDATION OF INSTRUCTIONAL MATERIALS FOR ELEMENTARY MATHEMATICS

PHILIP LESTER P. BENJAMIN, Ph.D.
Project Team Leader

SANDRA A. NANDING
Component Leader

Funded by:

University of Southern Mindanao

Year-end In-House Review
December 2023

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato

ABSTRACT

STRENGTHENING MOTHER-TONGUE BASED EDUCATION OF ELEMENTARY TEACHERS IN DEPED COTABATO/MBHTE BARMM THROUGH DEVELOPMENT AND VALIDATION OF INSTRUCTIONAL MATERIALS FOR ELEMENTARY MATHEMATICS
Project members: *Philip Lester P. Benjamin Ph.D. and Sandra A. Nanding*

Abstract. This extension project aims to strengthen mother-tongue based education in the DepEd Cotabato Division by focusing on instructional materials development and capacity building for elementary teachers. The project is motivated by several key considerations, including the promotion of linguistic and cultural diversity, improvement of student learning outcomes, and addressing the specific needs of students. By using the mother-tongue as the medium of instruction in the early years of education, the project aims to preserve and promote the linguistic and cultural heritage of students in the DepEd Cotabato Division. Research indicates that students who learn in their mother-tongue achieve better academic outcomes, and therefore, this project seeks to enhance student learning outcomes by providing tailored instructional materials that align with their linguistic and cultural background. Additionally, the project aims to build the capacity of teachers to effectively teach in the students' mother-tongue. To achieve its objectives, the project will develop high-quality instructional materials specifically for elementary mathematics. These materials will be designed to engage and educate students effectively. The developed materials will then undergo validation through data analysis and feedback from teachers, students, and parents. This validation process ensures that the materials are aligned with the curriculum and meet the needs of the students. Ultimately, this extension project strives to enhance mother-tongue based education in the DepEd Cotabato Division by providing customized instructional materials and improving the capacity of teachers. By doing so, the project aims to improve student learning outcomes and promote linguistic and cultural diversity in the region.

Keywords: Mother-tongue based education, instructional materials development, elementary teachers, DepEd Cotabato Division, elementary mathematics

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Philippines

NARRATIVE REPORT

A. BASIC INFORMATION	
1. Title	**Strengthening Mother-tongue based Education of Elementary Teachers in DepEd Cotabato/MBHTE BARMM through Development and Validation of Instructional Materials for Elementary Mathematics**
2. Status	■ Ongoing ☐ Completed (by December 2023) For projects to be completed by December 2023, please indicate if: ■ Competing ☐ Not competing
3. Project Leader Study Leader (Indicate College/Unit)	**Philip Lester P. Benjamin, Ph.D.** **Sandra A. Nanding** College of Science and Mathematics
Email Address	pjbenj@usm.edu.ph
Contact Number	09338245352
4. Lead Unit/College	**USM Graduate School/ College of Science and Mathematics**
Collaborating Unit/College	**DepEd Cotabato/ MBHTE BARMM**
5. Category	☐ Program ☒ Project ☐ Study
6. Classification	☐ Research ☐ Development ☒ Extension
	☐ Basic ☐ Applied ☒ Pilot Testing ☐ Prototype Development ☐ Tech. Promotion/Commercialization
7. Thematic Area	☒ Quality Learning, Skills Development, and Literacy ☐ Social Development, and Strong Institutions ☒ Preservation of Culture ☐ Environmental Protection, Conservation, and Risk Reduction ☐ Food Security and Poverty Reduction ☐ Good Health and Well-being ☐ Innovations in Science, Engineering, and Technology ☐ Sustainable Entrepreneurship and Management
8. Project Duration	**One Year**
9. Project Location	Nangaan, Kabacan, Cotabato
10. Total Budget Requested (Php)	60,000

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

B. TECHNICAL DESCRIPTION

1. **Rationale / Significance**

The reason we're extending this project is to make learning easier for kids in the DepEd Cotabato Division. We want to help teachers and students by creating materials and giving training that focus on using their own language. Here are a few important reasons:

1. **Keeping Things Diverse**: We know it's good for kids to learn in their own language because it helps them understand better. Also, it's a way to celebrate and protect the different languages and cultures in DepEd Cotabato Division.
2. **Making Learning Better**: Research says that when students learn in their own language, they do better in school. So, our project wants to make sure students get materials and teaching that fit their language and culture. This way, they can learn better.
3. **Helping Each Student**: We want to look at what each student in DepEd Cotabato Division needs. Our plan is to make materials that work for them and give teachers training that matches what the students are learning.

Overall, our goal with this project is to make learning in the mother tongue better in the DepEd Cotabato/MBHTE BARMM Division. We'll do this by creating materials that match how students speak and by helping teachers teach in a way that suits the students' language. This should make students do better in school and also make sure the different languages and cultures in the area are respected and valued.

Objectives (State the General Objectives and Specific Objectives)

General objective:
To improve mother-tongue based education of elementary school teachers in DepEd Cotabato by developing and validating instructional materials.

Specific objectives:
1. To develop high-quality mother-tongue based instructional materials in elementary mathematics that effectively engage and educate students.
2. To validate mother-tongue based instructional materials developed for elementary mathematics through data analysis and feedback from teachers, students, and parents.

2. **Methodology**

The methodology for implementing this project will be divided into three main phases: development, implementation, and evaluation.

PRE-IMPLEMENTATION/Development Phase:

a. Methodology, ethics, MOA, and permission protocols will be finalized.

Ethics:

- Obtain informed consent from participants.
- Ensure confidentiality and anonymity of participants.
- Follow ethical principles and guidelines for research involving human subjects.

Permission protocols:

- Obtain necessary permissions and approvals from relevant authorities such as DepEd Cotabato and the school where the extension project will be implemented.
- Establish a Memorandum of Agreement (MOA) outlining the roles and responsibilities of all parties involved in the project.

b. Needs assessment

IMPLEMENTATION Phase

a. Develop and refine existing instructional materials based on the curriculum and the identified needs of the teachers.
b. Validate the instructional materials through pilot testing with teachers, students, and parents.

3. **Accomplishment**

In February 2023, we successfully initiated contact with a representative from the local elementary school and presented our extension project to her. Our proposal was well-received, and we provided them with a comprehensive copy of our project plan.

Over the following months, we collected all the necessary documents, including informed consent and permission to proceed. To streamline the process, we utilized an existing memorandum of agreement, ensuring compliance with established protocols.

In March 2023, we completed a thorough needs assessment, which revealed a significant requirement for additional support in mathematics for students belonging to the Maguindanaon tribe. Recognizing the importance of teaching in their mother tongue, we identified this as a key focus area for our project.

As of June 2023, we have made substantial progress in revising our existing learning materials. Our team is meticulously double-checking the content to ensure there are no major issues or discrepancies before the materials are finalized for release. This attention to detail guarantees the quality and effectiveness of the materials in achieving our project goals.

Last month, we went to Nangaan Elementary School to check how well the math materials were working. These materials were translated into the Maguindanaon language. We also had a meeting with the teachers there.

We found a small issue during the test. Some words in the language the students speak were not used anymore, and they were using Filipino words instead. So, we need to make some changes to the materials we are creating.

4. **References (in APA format)**

5. **Problems Met and Recommended Action**

6. **Budget Utilization**

Component	Allocation	Utilized	% Utilized

7. **Attachments:**

a. Data, supplementary table and/or figures, photo documentation (when applicable)











b. Workplan

University of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

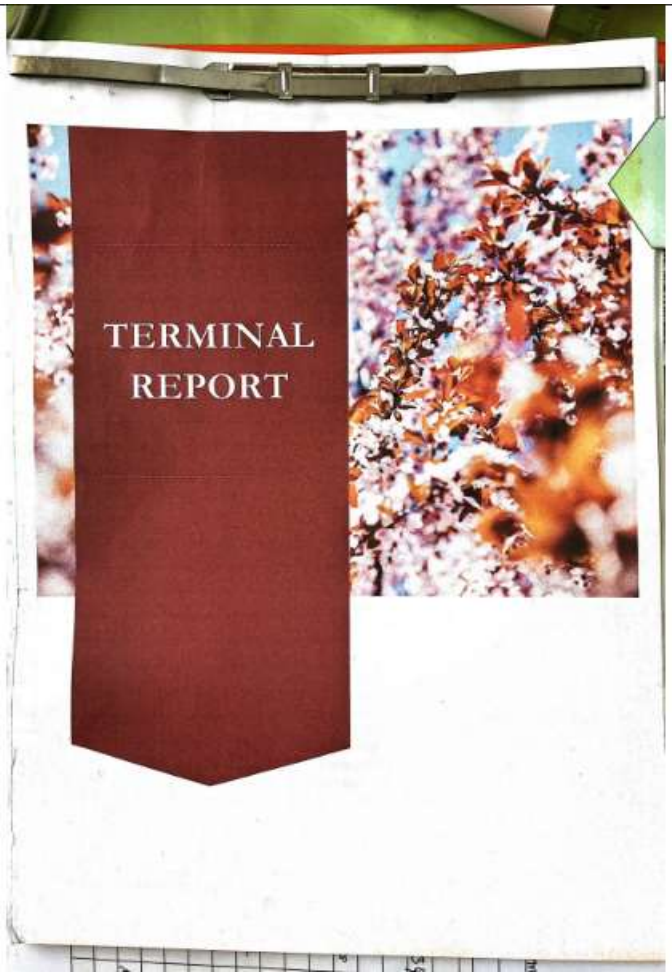
Work Plan

PROJECT TITLE: Strengthening mother-tongue based education of elementary teachers in DepEd Cotabato through instructional materials development and validation.

STARTING DATE: (01-01-23) **COMPLETION DATE: (12-31-23)**

Activity No	Major/Sub-Activity	Anticipated Results	Responsible Person	Resources Required	J	F	M	A	M	J	J	A	S	O	N	D	Milestones
1	Finalization of methodology, Ethics and permission protocols, MOA	Finalized methodology, Signed informed consent from participants, signed MOA	Philip Lester Benjamin, Sandra Nanding, Rowel Madio	Bondpaper, printer, gasoline for travels	x	x											10%
2	Conduct profiling or needs assessment	Profile and needs of participants	Philip Lester Benjamin and Sandra Nanding	Bondpapers, internet		x	x										20%
3	Development and refining of existing IMs	Developed and refined IMs	Philip Lester Benjamin Debbie Marie Verzosa Leonnore Tandog	Bondpapers, printer, internet, gasoline for travels, etc				x	x	x	x						25%
4	Validation of the instructional materials	Validated IMs	Sandra Nanding Meriam Rubio	Bondpapers, printer, internet, gasoline for travels, etc						x	x	x	x				25%
5	Report writing	Final report	Philip Lester Benjamin Sandra Nanding	Bondpapers, printer, internet										x	x	x	20%

7. Terminal Report



EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

TERMINAL REPORT

Strengthening Mother-tongue based Education of Elementary Teachers in DepEd Cotabato/MBHTE BARMM through Instructional Materials Development and Validation

Philip Lester P. Benjamin
College/Unit Head/Project Leader

Sandra A. Nanding
Component Leader

Debbie Marie Verzosa
Leorence Tandog
Florie Jane Tamon
Rowel Madio
Roel Valenton
Anna Jean Garcia
Leonard Paleta
Meriam Rubio
Jeaneth Licaros
Daryl Mae Mamon
Jonald Pimentel
Jennifer Pama
Honey Vicent Valle
Members

EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

TERMINAL REPORT

I. Executive Summary

This extension project aims to strengthen mother-tongue based education in the DepEd Cotabato Division through the development of instructional materials and capacity building for elementary teachers. The project is grounded in promoting linguistic and cultural diversity, improving student learning outcomes, and addressing the specific needs of students in the region.

By providing students with the opportunity to learn in their mother-tongue, the project seeks to preserve and promote linguistic and cultural heritage. Research indicates that students learn better when taught in their mother-tongue, which underscores the importance of this initiative in improving academic outcomes.

The project's objectives include developing high-quality mother-tongue based instructional materials in elementary mathematics and validating these materials through data analysis and feedback from teachers, students, and parents. By tailoring materials to students' linguistic and cultural backgrounds and building teachers' capacity to teach in the mother-tongue, the project aims to enhance education quality and promote diversity in the region.

A courtesy call was made to Barangay Captain Hon. Lumambas and the principal of Nangaan Elementary School, Ma'am Salapudin, to introduce the CSM's extension project for the school year 2023-2024. This project aims to support elementary teachers in enhancing their teaching by providing supplementary instructional materials for challenging topics in mathematics. The CSM extension unit, in collaboration with faculty members, conducted an inception meeting and needs assessment on November 16, 2023. Subsequently, a training-workshop on instructional material (IM) development and validating a developed instructional material was held in December.

Through this initiative, the CSM seeks to contribute positively to the professional development of elementary teachers and ultimately enhance the quality of education provided to students.

II. Financial Report

Budget Utilization

Component	Allocation	Utilized	% Utilized
Component 1: Development of high-quality mother-tongue based instructional materials in elementary mathematics that effectively engage and educate students.	1st Quarter	3,500	100%
	2nd Quarter	23,500	100%

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Component 2: Validation of mother-tongue based instructional materials developed for elementary mathematics through feedback from teachers, students, and parents.	3rd Quarter	29,958.38	100%
	4th Quarter	2,978.38	100%

III. Major Activities Undertaken

In February 2023, we initiated contact with a local elementary school representative and introduced our extension project, receiving positive feedback and providing a detailed project plan. Subsequently, we gathered necessary documentation, including consent forms, and secured permission to proceed, using an existing memorandum of agreement for efficiency and compliance.

In March 2023, a thorough needs assessment highlighted a specific need for mathematics support among Maguindanaon tribe students, emphasizing the importance of mother-tongue instruction. This insight guided our project's focus.

By June 2023, significant progress was made in revising our learning materials, with meticulous content review to ensure quality and alignment with project objectives.

On November 16, 2023, we conducted an inception meeting and pre-test at Nangaan Elementary School, identifying the need to adjust some materials due to language evolution among students.

On December 6, 2023, we conducted a program divided into two parts. The first part was a training session led by Dr. Debbie Marie B. Verzosa on instructional material (IM) development and validation. The teachers responded positively to the training, expressing enthusiasm and appreciation for the insights shared. The second part of the program involved the dissemination of the IM to the teachers. Each teacher received a copy of the IM, along with guidance on its implementation. The teachers were encouraged to provide feedback and suggestions for further improvement. Overall, the program was a success, and we are confident that the IM will greatly benefit the students' learning experience.

IV. Problems met during the conduct of the project

1. Changes in purchase requests (PRs) created delays in procurement
2. Conflict in availability of team members and stakeholders
3. Delayed release of project budget
4. Unforeseen weather conditions disrupting field activities
5. Changes in government policies affecting project plans
6. Insufficient staffing and resources allocated

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

TERMINAL REPORT

V. Recommendations

1. Establish a clear and streamlined process for PR creation and approval to minimize changes and delays.
2. Coordinate schedules in advance to ensure availability of all parties involved in project activities.
3. Advocate for timely release of project budgets and maintain regular communication with the funding agency.
4. Develop contingency plans for weather-related disruptions, such as rescheduling activities or implementing remote work arrangements.
5. Stay updated on government policies and regulations, and adapt project plans accordingly.
6. Allocate additional resources or personnel to address workload challenges and ensure timely project delivery.

VI. Project Impact/Output

The project is expected to at least generate the following:

Outputs:
- Developed and validated mathematics instructional materials tailored for mother-tongue based education.
- Improved mathematics academic performance and learning outcomes for students through the use of these materials.

Impact:
- Increased cultural pride and self-esteem among students as they see their language and culture represented in their education.
- Strengthened linguistic and cultural identity among students, fostering a sense of belonging and connection to their heritage.
- Enhanced quality of education in the area by providing effective and culturally relevant teaching materials, ultimately improving student engagement and understanding in mathematics.

VII. Supplemental Activities

VIII. Other Accomplishment

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IX. Pictorials





Inception Meeting with Teachers of Nangaan Elementary School



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Conduct of needs assessment and Pre-test



Visit at Nangaan Elementary School

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Training on IM Development and Validation of IM with the resource person Dr. Verzosa.



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8. Attendance

University of Southern Mindanao
EXTENSION SERVICES CENTER
Kabacan, Cotabato
ATTENDANCE SHEET

ACTIVITY: strengthening mother-tongue based education of elementary teachers in select contents through instructional materials development and validation
VENUE: GS Hall, USM DATE: APRIL 23, 2024
SPONSORS:

No.	Name	Gender	Designation/ Affiliation	Office/ Unit/ Organization	Mobile Number/ Email Address	Signature
1.	Jennifer R - PAMA	F	ASSO PROF. V/DM	Dept of Math, CSM	USM 095/253 9400	
2.	Sandra A. Nanding	F		Dept of Math/CSM	09206882397	
3.	Albert N. Ferraren	M	BSEM - Student	Dept. of CBDEM/ETO	0963[illegible]	
4.	Jovie C. Dorego	F	BSEM Student	Dept. of CBDEM/ETO	0994 373 4388	
5.	Saquira M. Abdullah	F	BSEM Student	CBDEM/ETO	09463[illegible]	
6.	Langalen, Patricia M.	F	BSEM Student	Dept. of CBDEM/ETO	0938[illegible]655	
7.	PAVITA, LEONARDO M.	M	MATH-CSM-USM			
8.	ROEL S. VALENTON	M	Math-Csm-usm	Math & Stat Dept	09497[illegible]905	
9.	Beryl Mae Hamm	F	Math	Math	09[illegible]63259	
10.	Fatima M. Afdal	F	Teacher-I	MBHTE-BARMM	09[illegible]4949	
11.	Ramona P. Tacuyan	F	Teacher-I	MBHTE-BARMM	09752[illegible]803	
12.	Bhai P. Manunto	F	Teacher -I	MBHTE - BARMM	09160[illegible]019	
13.	BAIDHANE L SULAIMAN	F	Teacher -I	MBHTE -BARMM	09064[illegible]998	
14.	Muhaimin M. Balabaran	F	T-III	MBHTE - BARMM	09858[illegible]398	
15.	NOOR L. AMON	F	T-I	MBHTE- BARMM	09[illegible]6	

CERTIFIED TRUE COPY:
MARGIE N. MOTUAN-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date:

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University of Southern Mindanao
EXTENSION SERVICES CENTER
Kabacan, Cotabato
ATTENDANCE SHEET

ACTIVITY:
VENUE: DATE:
SPONSORS:

No.	Name	Gender	Designation/ Affiliation	Office/ Unit/ Organization	Mobile Number/ Email Address	Signature
16.	MIKKO ANGELO M. ELIVAS	F	T-I	MBHTE - BARMM	09[illegible]9547	
17.	JOHAIMAE P. TOMINES	F	T-I	MBHTE - BARMM	09[illegible]0747	
18.	ROSHAIDA W. KARENA	F	T-I	MBHTE - BARMM	09[illegible]6988	
19.	SARAHJEAN A SALAMAN	F	T-III/TIC	MBHTE - BARMM	09[illegible]1594	
20.	AMELAIDA B. KASAN	F	T-I	MBHTE - BARMM	09[illegible]4	
21.	JEZIL ETH R. LICAROS	F	Assoc Prof	Math & Stat Dept./CSM	09120821356	
22.	NINA JEAN S. GARCIA	F	Assoc Prof	Math & Stat Dept/CSM	09328412468	
23.	JEFFREE LEE M. GAN	M	DM	CBDEM/ESO	09978[illegible]920	
24.	Lawrence Tandog	M	Prof VI	GS/CSM		
25.	Jonald L. Pimentel	M	Prof VI	Math & Stat.		
26.	[illegible] J. MACALUSO II	M	Asst Prof I	[illegible]		
27.	Sarah B. Lusarbal					
28.	[illegible] D. [illegible]			MATH & STAT DEPT		
29.	ROEL MATH	M	Assoc Prof 4	Math & Stat		
30.	[illegible]	M	Assoc Prof 5	Math and Stat		

CERTIFIED TRUE COPY:
MARGIE N. MOTUAN-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date:

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2025 Extension Project

1. Detailed Proposal

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

DETAILED PROPOSAL FOR EXTENSION

A. BASIC INFORMATION	
1. Project Title	Strengthening Barangay High Schools: Validating and Implementing Representation Approach-Based Learning Materials for Independent Study of Mathematics in Remote Schools
Component 1	Component 1. Building Capacity of Teachers in Instructional Development'
Component 2	Component 2. Building Capacity of Teachers in the Conduct of Action Research
Component 3	Component 3. Development and Validation of Representation Approach-Based Learning Materials for Independent Learning of Mathematics
Component 4	Component 4. Implementation of Representation Approach- Based Learning Materials for Improved Learning of Mathematics
2. Proponent/s Indicate Name Academic Rank, Office	Name: PROF. LEORENCE C. TANDOG Designation: Project Leader and Component Leader 3 College/ Unit: Department of Math & Stat/College of Science & Mathematics Name: PROF. LEONARD PALETA Designation: Component Leader College/ Unit: Department of Math & Stat/College of Science & Mathematics Name: PROF. DEBBIE MARIEB. VERZOSA Designation: Component Leader 2 College/ Unit: Department of Math & Stat/College of Science & Mathematics Name: PROF. PHILIP LESTER BENJAMIN & PROF. JUPITER PILONGO Designation: Component Leader 4 College/ Unit: Department of Math & Stat/College of Science & Mathematics
2.1. Email Address	lctandog@usm.edu.ph
2.2. Contact Number	09466115568
3. Lead Unit/College	Department of Math & Stat/CSM
3.1. Collaborating Unit/College	
3.2. Partner Agency	DepEd Cotabato
4. Thematic Area	☑ Quality Learning Skills Development and Literacy ☐ Food Security and Poverty Reduction ☐ Social Development, and Strong Institutions

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DETAILED PROPOSAL FOR EXTENSION

	☐ Good Health and Well-being ☐ Preservation of Culture ☐ Innovations in Science, Engineering, and Technology ☐ Environmental Protection, Conservation and Risk Reduction ☐ Sustainable Entrepreneurship and Management	
5. **Sustainable Development Goal/s**	☐ No Poverty ☐ No Hunger ☐ Good Health ☑ Quality Education ☐ Gender Equality ☐ Clean Water and Sanitation ☐ Renewable Energy ☐ Good Jobs and Economic Growth ☐ Innovation and Infrastructure ☐ Reduced Inequalities ☐ Sustainable Cities and Communities ☐ Responsible Consumption ☐ Climate Change ☐ Life Below Water ☐ Life on Land ☐ Peace and Justice ☐ Partnership for the Goals	
6. **Sector/Discipline**		
7. **Project Duration**	Start Date: January 02, 2025	Completion Date: December 31, 2025
8. **Project Location / Service Area**	North Cotabato	
9. **Total Budget Requested (Php)**	Php 70,000.00	**Fund Source:** Fund 01

B. TECHNICAL DESCRIPTION
1. **Need-based Rationale** (State rationale based on current set-up, the need, your solution, and connect) Please refer to Magbanua, G.G. (n.d.) Writing a Need-based Rationale for Extension Proposal, *TeknoGiya* University of Southern Mindanao.

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Rationale

Barangay high schools, formerly known as barrio high schools, were established in 1964 to provide wider access to secondary education (Orata, 1979). Since then, additional barangay high schools have opened with the passage of RA 6054 or the "Barrio High School Charter" in 1969. The establishment of barangay high schools is considered as equalizing opportunity for all Filipino children to access education regardless of their place of residence or economic condition.

The performance of Philippine barangay schools has always been viewed to be inferior. In 1987 the Department of Education (DepEd) temporarily halted the opening of barangay high schools with acknowledgement that the quality of instruction in most of the barangay high schools suffered as evidenced by poor results in national achievement tests (DepEd DO 69, s. 1987). The quality of education in barangay high schools could not be sufficiently maintained due to a lack of experienced teachers and funding (Ishida, 1995) resulting in a lack of quality material resources and infrastructures (Bai, 2023). However, due to the insistent demand of the local communities for secondary education and the pressing need to improve access to education in remote areas, barangay high schools continued to operate and increased in number.

Teacher shortage is a critical issue in many rural areas around the world. This shortage is magnified in barangay high schools which serve as entry employment for inexperienced teachers who at the same time are forced to teach out-of-field subjects due to teacher shortages or limited class sections to handle in remote schools. Covid 19 exposed the challenges of the digital divide and students in barangay high schools were further disadvantaged because they had no access to materials and tools needed for remote and independent learning (Gutierrez and Bilefsky, 2021). These challenges continue this post-pandemic as DepEd schools continued cancelation of face-to-face classes or shortened class periods during extreme weather conditions.

Self-regulated and independent study is vital in cases where teachers are not available to facilitate learning. Effective learning materials significantly support independent learning since resources that can be learned without needing the assistance of a teacher can empower students to take control of their studies, learn at their own pace, and develop self-discipline and independent thinking. Research shows that supplemental printed materials significantly facilitate successful learning of math concepts (Brown and Gilmer, 2009) and self-instructional worked examples are effective in the development of both conceptual and procedural knowledge (Sheldon, 2013).

In 2021, we initiated a multi-dimensional approach to respond to the challenges that emerged from the urgent educational adaptations driven by the pandemic through material and technology tools development. Our project introduced teaching innovations that utilized interactive elements, visual features, storytelling, and manipulable representations. Various studies have shown that these features and tools enhance learning (De las Peñas & Bautista, 2008), facilitate visualization (Taka, Taka, & Budinski, 2010), and develop creativity (Shelomovskiy & Nosulya, 2012). Representation is an important element in the study of mathematics and is considered at the heart of cognitions associated with mathematical activity (Kaput, 1987).

The results of our study showed significant improvements in students' understanding of mathematics and science concepts. Anchoring from the positive outcome of the research project, the faculty and graduate students of PhD Ed and MST Mathematics programs engaged lesson study, produced research lessons and Learning Activity Pages (LAPs) that use various representation approaches. The learning resources are designed in a manner that students can learn essential concepts and skills with minimal support or even without the assistance of a teacher. The initiative established a structure for a Professional Learning

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Community (PLC) where teachers and experts work collaboratively for professional development and improved quality of learning. This endeavor provided a venue for sharing and transfer of pedagogies. The materials are now ready for validation and use by target students, thus this project.

The proposed implementation of representation approach-based learning materials for independent study of mathematics concepts aims to address the scarcity of quality teachers and other unique educational challenges faced by students in barangay schools and promote equitable access to quality education for all Filipino students regardless of geographic location. The rationale behind this extension project is rooted in several key considerations:

1. **Mitigating the effect of teacher scarcity/unavailability.** In the absence of quality teachers, students can utilize carefully designed self-instructional Learning Activity Pages (LAPs) to develop essential mathematics skills and concepts.
2. **Enhancing learning outcomes.** The learning material allows students to learn at their own pace ensuring the concept is fully grasped or the skill is learned before moving on to the next material. Students can fit their learning experience to their needs that could potentially lead to better learning commitment and engagement. It also encourages collaborative learning among students fostering a community where knowledge and skills are collectively constructed and shared.
3. **Promoting lifelong learning.** The materials do not focus only mathematics contents instead uses these contents as tools to develop important mathematics skills such as pattern recognition, measurement, number sense and problem solving; and soft skills such as critical thinking, and adaptability. Development of traits that allow students to learn new information and skills on their own is a key competency in our rapidly changing society. Self-guided study improves capabilities, enhances self-efficacy and unlocks student's full potential.
4. **Improving the status of education in barangay high schools.** Barangay high schools remain the least option for students. Most are underpopulated because the quality of instruction continues to be below par with municipal or national high schools. These schools serve the underprivileged and marginalized population and deserve all the support a university can extend. The learning materials can help improve the quality of mathematics learning in remote schools. Empowering barangay high schools will boost the image and credibility of this type of school as a provider of basic education. In the long term, an improved image of barangay high schools can offer a solution to the continuous overcrowding of municipal and national high schools.

Overall, this extension project aims to strengthen education in barangay high schools through the development of quality material resources for independent study of mathematics thereby improving access to quality education among marginalized communities.

2. **Objectives** (State specific objectives based on Knowledge, Skills, and Attitude/Practice (KSA/P)

General objective: This project aims to enhance the mathematics education received by students in barangay high schools in DepEd Cotabato with the use of carefully designed and validated self-instructional learning materials.

Specific objectives:

1. Strengthen math teachers' capability to develop representation-based self-instructional materials, and conduct action research
2. Engage teachers in collaborative work of developing and validating learning materials.
3. Enhance mathematics performance and numerical literacy among barangay high school students through implementation of developed learning materials
4. Determine if there is a significant improvement in students' performance and mathematics skills before and after use of developed instructional materials.

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3. **Expected Output/s** (State in quantifiable form)

At the end of the extension activity, it is expected that:

1. Teachers are empowered with knowledge and skills in designing and developing material resources that are effective for students' self-guided study, and in the conduct of action research
2. A professional learning community is sustained where teachers and experts will continue to work collaboratively and share pedagogies for improved learning quality.
3. Learning Activity Pages (LAPs) are created that are tailored to mathematical abilities and needs for independent study of target clients.
4. LAPs are validated, pilot-tested, and packaged and/or lesson exemplars are implemented for online uploading.
5. LAPs are used to supplement learning of important mathematics content and skills for improved numerical literacy among students in barangay high schools.
6. Students in barangay high schools improved in terms of mathematics performance and numerical literacy.
7. Final versions of LAPs are copyrighted.

4. **Review of Literature** (Present related research/projects/activities that have been conducted).

5. **Results Framework**

Implementation			Results	
Inputs (State the materials needed in the conduct of activities)	**Activities** (State the major activities of the project to attain the objectives)	**Outputs** (State the expected quantifiable outputs based on the activities conducted)	**Outcomes** (State the objectives of the project based on KSA/P of the partner-beneficiaries)	**Impact** (State the possible impact of the project either of the following: socio-economic, peace and order, environment, literacy and numeracy, etc.)

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

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6. **Methodology** (Brief description of how the project will be implemented to attain the objectives).

6.1. Pre-implementation (Social Preparation)

Development Phase:

1. **Baseline data**
   - current mathematics capabilities of students in Barangay High Schools.
   - existing materials/learning resources available in barangay high schools
   - performance of barangay high schools in division/nationwide evaluations from secondary sources.
   - number of school graduates who continued to the next level of education (ex. junior to senior HS) or admission rate of graduates to universities.
2. **Needs assessment**
   - specific needs of students that can be addressed through material development.
   - weaknesses of students that should be considered when designing the LAPs
   - contextual factors to learning.
3. **Brainstorming, initial planning and training**
   - Teacher-participant orientation
   - Brainstorming on topics, skills, and lesson design
   - Initial planning, topic assignment, and timelines
   - Training of teacher participants
4. **Development, validation, and Refinement of developed LAPs**
   - Validation of developed LAPs
   - Pilot-testing of developed materials
   - Refinement based on validation and pilot testing
   - Development of additional learning materials based on needs
5. **Packaging and reproduction of LAPs**
   - Final lay-out and graphic design
   - Printing and packaging of final version of LAPs
   - Reproduction of LAPs for implementation

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

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Philippines

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DETAILED PROPOSAL FOR EXTENSION

6.2. Implementation (Community Development)

Implementation Phase:

- Provide ongoing support to school heads and teacher participants during the implementation of the materials in the classroom.
- Immediate evaluation of students' outputs (answers in the LAPs) as basis of continuing learning support to students and lesson refinement
- Monitor and evaluate the implementation of the materials through teacher and student feedback.

Evaluation Phase:

- Assess the effectiveness of the extension project in improving student learning outcomes.
- Assess the effectiveness of the developed instructional materials in fostering lifelong learning.
- Analyze the impact of the developed materials in the school performance and in addressing some challenges of barangay high schools particularly in mitigating teacher scarcity

To do this, we have the following.

Development Phase:

1. **For baseline data we will**
   - Use researcher-made mathematics achievement test and standardized (if available) numerical literacy test to gather data on current mathematics capabilities of students in Barangay High Schools.
   - Conduct ocular visit and interview with teachers and school heads about existing materials/learning resources available in barangay high schools
   - Use available secondary sources to describe the performance of barangay high schools in division/nationwide evaluations.
   - Survey on the number of school graduates who continued to the next level of education (ex. junior to senior HS) or admission rate of graduates to universities.
2. **For needs assessment, we will**
   - Conduct diagnostic or pretest to identify specific needs of students that can be addressed through material development.
   - Interview teachers to identify weaknesses of students that should be considered when designing the LAPs.
   - Site visit to the target school and interview with school heads to identify other contextual factors that may be considered during project implementation.

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Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

WORK PLAN SCHEDULE

PROJECT TITLE:	Strengthening Barangay High Schools: Validating and Implementing Representation Approach-Based Learning Materials for Independent Study of Mathematics in Remote Schools						
COLLEGE/ DEPARTMENT/ UNIT:	CSM/Math & Stat Dept. in collaboration with GS/MST and PhD Ed Math Programs						
PROPONENT (S):	Leorence Tandog						
Total Duration (in months)	12 months	**Planned Start**	January 2025	**Planned End**	December 2025		
Activities	**Expected Outputs**	**Responsible Person**	**Schedule of Activities** 1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	**Milestone (%)**
1. Building Capacity of Teachers in Instructional Material Development (one day)	-30 teachers capacitated in IM development -design and sample lay-out of IM	L Paleta (RS) DB Verzosa (RS) L Tandog (RS) J Pilongo (F) R Valenton (F) S Nanding (F) PL Benjamin (M)	• Seminar-workshop • Initial Planning • Brainstorming				10%
2. Development of Representation Approach-Based Learning Materials for Independent Learning of Mathematics (two months)	-20 Learning Mathematics Activity Pages (LMAPS) produced thru lesson study	L Tandog (RS) DB Verzosa (RS) L Paleta J Pilongo (F) R Madio (F) S Nanding (F) PL Benjamin (F) AJ Garcia (F) DM Mamon (F)	• Brainstorming • Lesson Study • Writing • Design and Lay-out of LMAPS				50%

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Philippines

EXTENSION SERVICES OFFICE

WORK PLAN SCHEDULE

3. Validation and Packaging of Representation Approach-Based Learning Materials for Independent Learning of Mathematics (two months)	-20 validated and packaged LMAPS	J Pilongo (RS) L Tandog (RS) DB Verzosa (RS) L Paleta (F) R Valenton (F) S Nanding (F) AJ Garcia (F) DM Mamon (F) L Yabes (F)		• Validation & Pilot testing of LMAPS • Revision and Packaging of LMAPS			70%
Building Capacity of Teachers on Action Research (one day)	-10 partner teachers capacitated to implement action research using LMAPS	DB Verzosa (RS) L Tandog (RS) J Paleta (F) R Madio (F) R Valenton (M)		• Seminar-workshop • Initial Planning for action research			80%
Implementation of Representation Approach-Based Learning Materials for Improved Learning of General Mathematics (two months)		PL Benjamin (RS) L Tandog (F) DB Verzosa (F) J Pilongo (F) R Madio (F)			• Deployment & use of LMAPS by target beneficiaries • Pretest & Posttest	• Data analysis • Report writing & finalization	100%

2. Notice to Proceed and Approval Sheet

Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Tel. No. (064) 572-2638
e-mail address: vprde@usm.edu.ph

OFFICE OF THE VICE PRESIDENT FOR RESEARCH, DEVELOPMENT AND EXTENSION

UNIVERSITY RESEARCH DEVELOPMENT & EXTENSION COMMITTEE

APPROVAL SHEET

I. **BASIC INFORMATION**

URDEC No.: _____
___ Program
_X_ Project
___ Study
___ Others

Title: Strengthening Barangay High Schools: Validating and Implementing Representation Approach-Based Learning Materials for Independent Study of Mathematics in Remote Schools

Author(s): Leorance C. Tandog

Duration/ Period of Conduct: January 2025 – December 2026

Implementing Agency/Unit: USM

Location/Research Station: USM

Budget Detail: Php 70,000.00

II. ACTION TAKEN: ☑ Approved ☐ Disapproved Remarks: _____

Date of Implementation: _____

RESEARCH REVIEW COMMITTEE

LYDIA C. PASCUAL
RDO Director

JALALODIN S. MAROHOM
IPTTBDO Director

JURHAMID C. IMLAN
USMARC Director

GLYN G. MAGBANUA
Extension Director

MA. TEODORA N. CABASAN
Publication Director

_____
Statistical Pool

Approved by: DEBBIE MARIE B. VERZOSA
VP for RDE

III. REVIEWED BY:

	Date	Remarks
Statistical Pool	_____	_____

IV. FOR ISSUANCE OF:

____ Notice to Proceed
____ Special Order
____ Research Contract
____ Policy Guidelines (IPR, PNS, IACUC Permit, others _____)

V. OUTPUTS:

_____Progress Report (Quarterly)
_____Financial Report
_____Completion Report
_____Last Quarter Honorarium released upon submission of terminal/publishable article
_____Terminal Report/Publishable Article Submitted

Recorded by: _____

USM-RES-F24-Rev.1.2020.02.18

CERTIFIED TRUE COPY:
MARGIE N. BUTUAN-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date: _____

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

NOTICE TO PROCEED

NTP #: 2025-____
Date: November 26, 2024

PROF. LEORENCE C. TANDOG
PROF. LEONARD M. PALETA
PROF. DEBBIE MARIE B. VERZOSA
PROF. PHILIP LESTER BENJAMIN
PROF. JUPITER G. PILONGO
University of Southern Mindanao
Kabacan, Cotabato

Dear Mesdames and Sirs:

Your extension proposal has been approved by the URDEC for 2025 funding in the amount of **Php 60,000.00** charged to Fund 101. Notice is hereby given that the conduct of the study entitled **"Strengthening Barangay High Schools: Validating and Implementing Representation Approach-Based Learning Materials for Independent Study of Mathematics in Remote Schools"** may commence not later than 7 days after the receipt of this notice up to December 2025.

This Study has the following components leaders and incentive:

Project Leader: ***Prof. Leorence C. Tandog***, with honorarium

Component 1. **Building Capacity of Teachers in Instructional Development'**
Component Leader: ***Prof. Leonard Paleta*** with honorarium;

Component 2. **Building Capacity of Teachers in the Conduct of Action Research**
Component Leader: ***Prof. Debbie Marie B. Verzosa*** with honorarium;

Component 3. **Development and Validation of Representation Approach-Based Learning Materials for Independent Learning of Mathematics**
Component Leader: ***Prof. Leorence C. Tandog***, with honorarium and;

Component 4. **Implementation of Representation Approach- Based Learning Materials for Improved Learning of Mathematics**
Component Leader: ***Prof. Philip Lester Benjamin; Prof. Jupiter Pilongo***, with honorarium

You shall be responsible for ensuring the completion of the extension project in accordance with the approved work and financial plan. Furthermore, you have to submit a quarterly progress report and make an oral presentation during the Midyear and Year-End University Research Development and Extension In-House Review. Upon completion of the study, you have to submit the terminal report and your outputs (IEC/s in both hard and e-copy) of extension results before you can claim your incentive as program/project/component leader.

In the event that you discontinue the project without justifiable reasons, you have to refund/return to the management the total amount you have actually spent; prior to the time you discontinue the project. In addition, you are required to submit the necessary output during the period you conducted the project.

Please acknowledge receipt and acceptance of this NOTICE by signing both copies in the space provided below.

Very truly yours,

GLYN G. MAGBANUA, PhD
Director, ESO

Recommending approval:

DEBBIE MARIE B. VERZOSA, PhD
Vice Pres. for Res., Dev't. & Ext'n.

Approved by:

FRANCISCO GIL N. GARCIA, RPAE, PhD
SUC President IV, USM

USM-RES-FoB-Rev.1.2020.02.18

CERTIFIED TRUE COPY:
MARGIE N. BUTUAN-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date:_____

3. MOA

MEMORANDUM OF AGREEMENT

KNOW ALL MEN BY THESE PRESENTS:

This Memorandum of Agreement made and entered into by and between:

UNIVERSITY OF SOUTHERN MINDANAO (USM), a level IV state University, created and operating under Republic act No. 763, s. 1952, as amended and Presidential Decree No. 1312, s. 1978 with a principal office and postal address at Bai Matabay, Plang Avenue, Poblacion, Kabacan, Cotabato, represented herein by its President, **JONALD L. PIMENTEL, PhD,** hereinafter referred to as the **"USM-Kabacan";**

-and-

Schools Division Office of Cotabato (SDO-Cotabato), a DepEd division of schools, with principal office address at Cotabato Province Capitol Compound, Amas, Kidapawan City represented herein by **ROMELITO G. FLORES, CESO V, School Division Superintendent, Cotabato**, hereinafter referred to as **"SDO-Cotabato"**.

Jointly, the **USM** and the **SDO-Cotabato** herein referred to as **"PARTNERS".**

WHEREAS, the **SDO-Cotabato**, supports schools and learning centers and enables them to deliver accessible and quality education to the community it serves, by implementing education plans and policies, monitoring implementation of curriculum standards and providing instructional supervision and/or technical assistance and building communities of good practices, ensuring equitable distribution and allocation of resources while establishing linkages among educational stakeholders;

WHEREAS, the **SDO-Cotabato** recognizes the importance of developing innovative approaches to support student learning, especially through independent study and localized instructional materials in mathematics;

WHEREAS, the **SDO-Cotabato** recognizes the need for self-learning instructional materials and capacity building in the development of instructional materials and action research;

WHEREAS, the **USM** is a government institution of higher learning established in 1952 by Bai Matabay Plang, a state University with four mandated functions, namely: instruction, research, extension, and production;

WHEREAS, the **USM** through its College of Science and Mathematics and the University Extension Services Center, aims to uplift education in underserved communities through research-based extension services;

WHEREAS, the **USM**, as an academic institution, through the Office of the University Extension Services Center, supports SDO-Cotabato through capacity-building, instructional material development, and research-based extension activities;

NOW THEREFORE, for and in consideration of the foregoing premises and strong commitment of **PARTNERS** to advance the quality of education in the region, **PARTNERS** hereby agree to collaborate in the planning implementation, and evaluation of the said extension project under the following provisions:

USM by:
JONALD L. PIMENTEL, PhD
President

SDO-Cotabato by:
ROMELITO G. FLORES, CESO V
Superintendent, DepEd Cotabato Division

Witness:
LEORENCE C. JANDOG, PhD
VPAA/Project Leader

DEBBIE MARIE B. VERSOZA, PhD.
VPRDE

GLYN G. MAGBANUA, PhD.
ESO, Director

PHILIP LESTER P. BENJAMIN, PhD.
CSM, Dean

MARY JOY D. BAUTISTA, PhD
EPS- Mathematics

JUVY B. TITURA, EdD.
EPS- LRMDS

Section 1. Scope of Work/Description of the Project

PARTNERS hereby undertake the implementation of Extension Project with the title **"Strengthening Barangay Schools: Validating and Implementing Representation Approach-Based Learning Materials for Independent Study of Mathematics in Remote Schools"** with an approved budget of PhP 60,000.00.

Section 2. Obligations of UNIVERSITY OF SOUTHERN MINDANAO
*The **USM shall:***

1. *Conduct extension activities with permission and proper consultation with concerned and target participants;*
2. *Conduct capacity-building activities and workshops for mathematics teachers of SDO-Cotabato;*
3. *Lead the development, validation, and pilot-testing of representation approach-based Learning Activity Pages (LAPs);*
4. *Provide technical and academic expertise in instructional material development and implementation;*
5. *Facilitate monitoring and documentation of the project outcomes and learning impact;*
6. *Share results of the implementation with relevant stakeholders and propose scaling strategies where applicable.*

Section 3. Obligations of the Schools Division Office of Cotabato
The **SDO-Cotabato shall:**

1. *Recommend beneficiary schools for the extension project.*
2. *Advise school heads to designate participating mathematics teachers and ensure their attendance in training and project-related activities.*
3. *Ensure that school heads provide the necessary venue and support for workshops, validation, and pilot-testing activities.*
4. *Encourage collaboration among teachers in developing and refining LAPs.*
5. *Provide feedback and reflections on the implementation to guide project refinement.*
6. *Ensure the dissemination and sustained use of validated materials within the school.*

Section 4. Amendments

No amendment or modification of any of the terms and conditions of this Agreement shall be valid unless evidenced by a written Agreement executed by the parties' respective authorized representatives.

Section 5. Arbitrary Clause

If any dispute or difference of any kind whatsoever shall arise between the parties in connection with the implementation of this Agreement, the parties shall make an effort to resolve such dispute or difference by mutual agreement. Accordingly, the parties may resort to court only after all efforts to settle the dispute amicably have been exhausted.

USM by:
JONALD L. PIMENTEL, PhD
President

SDO Cotabato by:
ROMELITO G. FLORES, CESO V
Superintendent, DepEd Cotabato Division

Witness:
LEORENCE CUTAMORA, PhD
VPAA/Project Leader

DEBBIE MARIE B. VERSOZA, PhD.
VPRDE

GLYN G. MAGBANUA, PhD.
ESO, Director

PHILIP LESTER P. BENJAMIN, PhD.
CSM, Dean

MARY JOY D. BAUTISTA, PhD
EPS-Mathematics

JUVY B. TITURA, EdD.
EPS-LRMDS

Section 6. Binding Effect

This Agreement shall be effective immediately upon signing hereof and shall remain in full force and effect for the activities under this Agreement until 2026, unless sooner terminated in writing by either of the parties with written consent from the other party and subject to yearly evaluation.

IN WITNESS WHEREOF, the parties, through their respective representatives, have hereunto affixed their signature this _____ day of _____, 2025 at _____, Cotabato, Philippines.

SCHOOLS DIVISION OFFICE OF COTABATO (SDO-COTABATO)

ROMEO G. FLORES, CESO V
Superintendent, DepEd Cotabato Division

UNIVERSITY OF SOUTHERN MINDANAO (USM)

JONALD L. PIMENTEL, PhD
President

SIGNED IN THE PRESENCE OF:

LEORENCE C. TANDOG, PhD
VPAA/Extension Project Leader

DEBBIE MARIE B. VERZOSA, PhD
VP RDE

PHILIP LESTER P. BENJAMIN, PhD
CSM Dean

GLYN MAGBANUA, PhD
ESO Director

MARY JOY D. BAUTISTA, PhD
EPS-Mathematics

JUVY B. NITURA , EdD
EPS – LRMDS

ACKNOWLEDGMENT

REPUBLIC OF THE PHILIPPINES)
Municipality of Kabacan, Cotabato)S. S.

BEFORE ME, a Notary Public, for and in the Municipality of Kabacan, Cotabato, this ____ day of APR 14 2026 2025, personally appeared:

	ID No.	Issued on/Issued at
ROMELITO G. FLORES, CESO V		
JONALD L. PIMENTEL, PhD	P13904608	JULY 01, 2016 / DFA DAVAO

Known to me are the same person(s) who executed the foregoing Memorandum of Understanding and they acknowledged to me that the same is of their own will and voluntary act and deed and that of the institutions they represent.

The foregoing instrument refers to a Memorandum of Understanding (MOU), consisting of three (4) pages, including the page in which this Acknowledgement is written, signed by the parties, including their instrumental witnesses on each and every page thereof and sealed with my Notarial Seal.

WITNESS MY HAND AND SEAL, on the date and place above written.

NOTARY PUBLIC

REGERICK L. BENITO
NOTARY Public for the Province of Cotabato
Valid Until December 31,2026
Notarial Commission No. 01-2025
PTR No. 4379824/01-07-26/ Amas, Kidapawan City
IBP O.R No. 563735/12-08-25/North Cotabato Chapte
Roll No. 46786

Doc. No. 78;
Page No. 78;
Book No. 4
Series of 2025.

REGERICK L. BENITO NOTARY PUBLIC

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

4. Meetings

Minutes of Meeting

Date: March 28, 2025
Time: 10:00 AM

MEETING on Math Dept Extension
INITIAL PLANNING
✓MOA w/ Dept'd [c/o Mam Debbie] ✓
Schedule
Capacity building [April 9, 2025]
GS to join | Siennon Institute ft Linguistics
- to attend
- training design
- laminate materials
withdraw not needed

i.) Needs assessment - interview teachers
c/o Bryan Floran those topics that
think needed

ii) Capacity building
2 days
Workshop
speaker : lecturer duties
topics : mathematics teaching
in development
Non-routine problems
Ian Goran (online) / Flor Francisco
Debbie Verzosa
Leorina Tandog] Re-echo ICT@Ateneo
Jeanette Liano
Tentative Date: May 30-31, 2025 [Fri & Sat]
Venue: Graduate School

- Ark in CP Register ID, ID, Affidavit
about official receipts

Output of the seminar :
Dept'd endorsement - to process @ Rectorate
Apply for CPD units
- Validation during workshop
- Template that they will use to enhance
their IMs
- Action research [Pupos / Dr. Bill]

Topic : [SEMINAR]

1.) Development of representation approach -
learning materials [Debbie Verzosa]
May 30, 8:30 -10am /GS Hall

2.) Writing good action problems [Ian Goran w/ Rovel Mabbo]
May 30, 10:30am - 12nn /GS Hall

3.) Workshop
1-3 pm

4.)
a. Action research [Aiven Pupos]
May 30, 3pm / GS Hall
b. Design-based research [Leorina Tandog w/ Jeanette Liano]
May 31, 8:30 am - 12am
5.) Workshop
Time: 10:30am

Committee:

Instructional Design / Application form / Evaluation Form - [Rovel Ang Sandra]
Compile CVs in PRC template - Lawton Angeles
Financial projection - Daryl Mamon
Certificates - Lawton / Jayster -
Publicity - Benjamin
Program of activities - Rovel

Deadline: MONDAY [March 31, 2025]

Registration: Php 2,000
Registration Form: "I commit to attend"

Conference Chair: Benjamin / Tandog
Title:
Documentation/: Manuel Lisondra /
completion report DIT and PhD students



Planning Meeting for the 2025 Training-Workshop



PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

Minutes of Meeting

Date of Meeting: May 24, 2025
Time: 4:00 PM – 5:00 PM
Platform: Google Meet (Online)

Agenda

1. Final preparations for the May 30–31 training-workshop
2. Distribution of tasks and responsibilities

Attendance:

- Philip Lester Benjamin
- Sandra Nanding
- Arnel Toledo
- Jennifer Pama
- Leorence Tandog
- Debbie Marie Verzosa
- Leonard Paleta
- Jupiter Pilongo
- Anna Jean Garcia
- Daryl Mae Mamon
- Roel Valenton
- Rowel Madio
- Lawton John Yabes
- Jeaneth Licaros
- Jead Macalisang
- Fitzmee Ann Tamulak
- Hannah Jane Faith Palmos
- Jaymark Diaya
- Normaila Putong
- Dominic Carajay

Discussion

A. Task Checklist and Assigned Persons
   1. Venue Setup
      TV screen at the back
      White screen for projection
      Laptop assigned per TV screen
      In-charge: Jead Macalisang
   2. Audio Equipment
      5 wireless microphones
      2 for speakers
      2 for audience
      1 for emcee
   3. Backup batteries for mics
   4. Cooling Equipment
      2 electric fans (in case air-conditioning fails)
   5. Training Materials
      Markers
      Bond paper
      Manila paper
      Ballpens
      In-charge: Fitzmee Ann Tamulak
   6. Restroom Check
      Ensure comfort rooms (CR) are functioning and accessible
      In-charge: Jay Mark Diaya

B. All team members agreed to finalize preparations by May 29, 2025.
C. A short final coordination briefing will be scheduled prior to the workshop day.



Meeting end at 6:00 PM

5. Training-workshop



fb link: https://web.facebook.com/share/p/1ecWYUPh48/

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION



PROGRAM

SEMINAR-WORKSHOP ON EMPOWERING EDUCATORS: CRAFTING LEARNING MATERIALS AND IMPLEMENTING DESIGN-BASED ACTION RESEARCH

Venue: Graduate School, University of Southern Mindanao, Kabacan, Cotabato

Date: May 30-31, 2025

This serves as an invitation

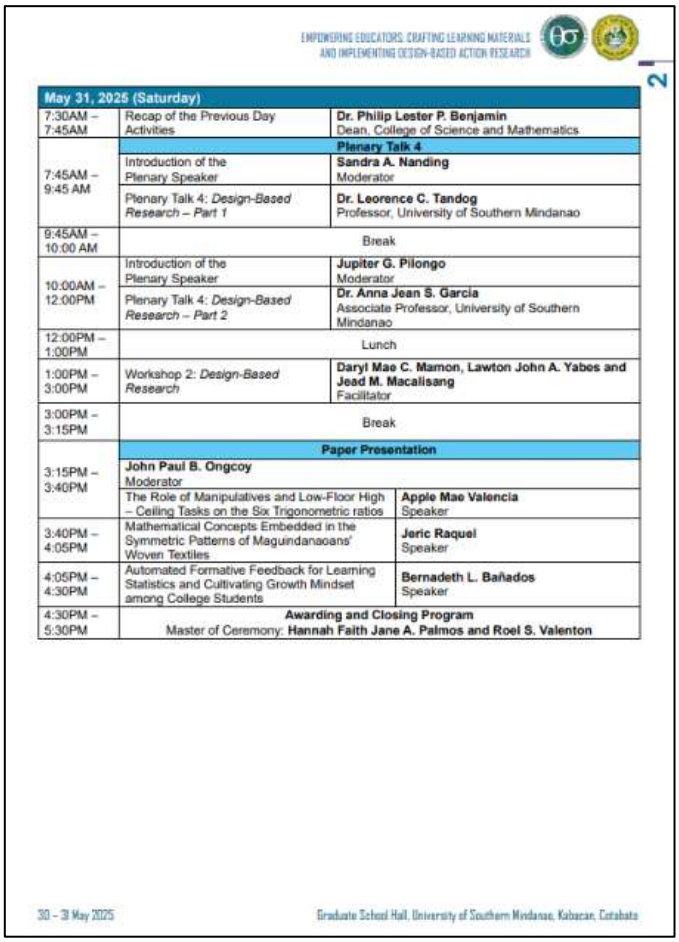
EMPOWERING EDUCATORS: CRAFTING LEARNING MATERIALS AND IMPLEMENTING DESIGN-BASED ACTION RESEARCH

1

Schedule of Activities

May 30, 2025 (Friday)		
6:30AM – 7:15AM	**Registration**	
7:15AM – 7:45 AM	**Opening Program** Master of Ceremony: **Hannah Faith Jane A. Palmos and Roel S. Valenton**	
	Invocation and National Anthem	**AVP**
	Welcome Remarks	**Dr. Philip Lester P. Benjamin** Dean, College of Science and Mathematics
	Overview and Rationale	**Dr. Leorence C. Tandog** Vice President for Academic Affairs
7:45AM – 9:45 AM	**Plenary Talk 1**	
	Introduction of the Plenary Speaker	**Roel S. Valenton** Moderator
	Plenary Talk 1: *Action Research*	**Ms. Aurea Puyos** Senior Instructor, Notre Dame of Kidapawan College
9:45AM – 10:00 AM	Break	
10:00AM – 12:00 PM	**Plenary Talk 2**	
	Introduction of the Plenary Speaker	**Rowel P. Madio** Moderator
	Plenary Talk 2: *Writing Good Math Problems*	**Dr. Ian June L. Garces** Associate Professor, Ateneo de Manila
12:00PM – 1:00PM	Lunch	
1:00PM – 2:00PM	**Plenary Talk 3**	
	Introduction of the Plenary Speaker	**Leonard M. Paleta** Moderator
	Plenary Talk 3: *Development of Representation Approach - Learning Materials*	**Dr. Debbie Marie B. Verzosa** Professor, University of Southern Mindanao
2:00PM – 2:15PM	Break	
2:15PM – 4:15PM	Workshop 1: *Development of Learning Mateirals*	**Sandra A. Nanding, Watarie E. Manto, and Leif Cullin A. Matandog** Facilitator
4:15PM – 4:40PM	**Paper Presentation**	
	Fitzmee Ann D. Tamulak Moderator	
	Bridging Ethnomathematical Practices of Obo Manobo Tahiti Farmers and Mathematics Education (Phase 2): Designing Mathematical Problem and Exploring Teachers' Perception	**Wrendell Juntilla** Speaker
4:40PM – 5:05PM	The Application of Enhanced Damath in Learning Operations on Integers and Developing Strategic Thinking	**Cherrylee Buhay** Speaker
5:05PM – 5:30PM	The Effect of PowToon to the Proficiency Level in General Mathematics of Grade 11 Students in Bacongco National High School	**Elaine Grace H. Adto** Speaker

30 – 31 May 2025 Graduate School Hall, University of Southern Mindanao, Kabacan, Cotabato



EMPOWERING EDUCATORS: CRAFTING LEARNING MATERIALS AND IMPLEMENTING DESIGN-BASED ACTION RESEARCH

2

May 31, 2025 (Saturday)		
7:30AM – 7:45AM	Recap of the Previous Day Activities	**Dr. Philip Lester P. Benjamin** Dean, College of Science and Mathematics
7:45AM – 9:45 AM	**Plenary Talk 4**	
	Introduction of the Plenary Speaker	**Sandra A. Nanding** Moderator
	Plenary Talk 4: *Design-Based Research – Part 1*	**Dr. Leorence C. Tandog** Professor, University of Southern Mindanao
9:45AM – 10:00 AM	Break	
10:00AM – 12:00PM	Introduction of the Plenary Speaker	**Jupiter G. Pilongo** Moderator
	Plenary Talk 4: *Design-Based Research – Part 2*	**Dr. Anna Jean S. Garcia** Associate Professor, University of Southern Mindanao
12:00PM – 1:00PM	Lunch	
1:00PM – 3:00PM	Workshop 2: *Design-Based Research*	**Daryl Mae C. Mamon, Lawton John A. Yabes and Jead M. Macalisang** Facilitator
3:00PM – 3:15PM	Break	
3:15PM – 3:40PM	**Paper Presentation**	
	John Paul B. Ongcoy Moderator	
	The Role of Manipulatives and Low-Floor High – Ceiling Tasks on the Six Trigonometric ratios	**Apple Mae Valencia** Speaker
3:40PM – 4:05PM	Mathematical Concepts Embedded in the Symmetric Patterns of Maguindanaoans' Woven Textiles	**Jeric Raquel** Speaker
4:05PM – 4:30PM	Automated Formative Feedback for Learning Statistics and Cultivating Growth Mindset among College Students	**Bernadeth L. Bañados** Speaker
4:30PM – 5:30PM	**Awarding and Closing Program** Master of Ceremony: **Hannah Faith Jane A. Palmos and Roel S. Valenton**	

30 – 31 May 2025 Graduate School Hall, University of Southern Mindanao, Kabacan, Cotabato

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION









PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

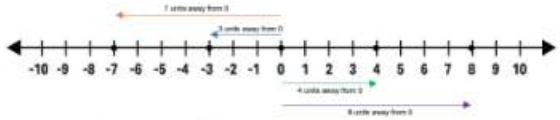
Absolute Value – How Far from Zero?

By: Elma Mae R. Donato, Phd Ed-Math 1

Learning Objectives:

- Identify absolute value as distance from zero on a number line
- Represent absolute value in multiple ways
- Connect absolute value to real-world situations

PART 1: Visual Representation – Number Line Distance



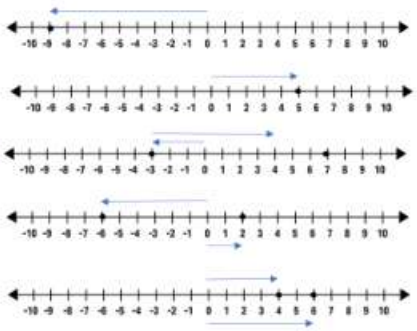
From the illustration above, we can deduce the following:

Number	Distance from 0	Absolute Value
–7	_____ units	|-7| = 7
–3	3 units	|-3| = _____
4	_____ units	|4| = 4
6	6 units	|6| = _____

PART 2: Symbolic (Algebraic) Representation

Directions: Write and evaluate the absolute value of the following expressions

1. \|−9\|=____
2. _____
3. \|-3 + ____\| = 4
4. \|−6\|+\|2\|=____
5. _____ = 10



Challenge:

1. \|−4−6\|=_____ 2. \|−3\|•\|−2\|=_____

PART 3: Verbal Representation

Directions: Explain in words

1. How would you describe an absolute value of a number?
2. Which numbers have an absolute value of 2? How do you know?
3. How can you explain why the absolute value of 0 is 0??

PART 4: Contextual Representation – Real-Life Scenarios

Directions: Read the situations and write an absolute value equation.

1. A diver descends 15 meters below sea level.
   What is the absolute value of the diver's elevation?
   \|−15\|=15 ⟶ \|x\|=15 where x represents the diver's elevation relative to sea level
2. The temperature dropped from 5°C to –6°C overnight.
   What is the absolute value of the temperature change?
3. You owe ₱25,000.
   What's the absolute value of your debt?
4. Maria walked 3 blocks west and then 4 blocks east of her starting point.
   What is her total distance from the origin, and what is the absolute value of her final position?
5. In a basketball game, Team A scored 78 points, and Team B scored 65 points.
   What is the absolute value of the point difference between the two teams?

Part 5: Reflection

1. Why do we use absolute value when measuring distance?
2. Can the absolute value of a number ever be negative?
3. How does absolute value help make sense of negative numbers in real life?

UNIVERSITY OF SOUTHERN MINDANAO
GRADUATE SCHOOL
Kabacan, Cotabato

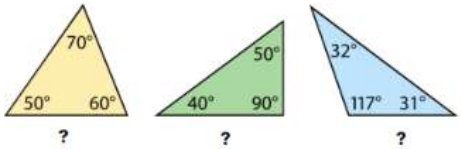
TRIANGLE TRIGONOMETRY SAMPLE WORKSHEET

Objective:

Solve problems involving oblique triangles using law of sines and cosines. (M9GE- IVh-j-1)

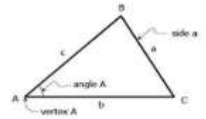
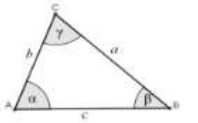
Activity 1-A: **Name It!**

Identify whether the figures are oblique triangles or not.

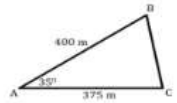
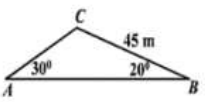


Activity 1: **Gotcha!**

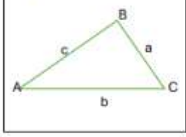
A. Fill in the missing by identifying the opposite side/s or opposite angle/s of the given triangle.

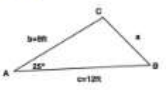
1.)	2.)
	
• side ___ is opposite angle 'A'. • side b is opposite angle _____. • side _____ is opposite angle 'C'.	• side ___ is opposite angle 'A'. • side b is opposite angle _____. • side _____ is opposite angle _____.

B. Count the number of angle/s and side/s of the triangle then indicate whether to use Law of Sines/Cosines to find the missing on the triangle.

	
• no. of angle/s given: _____ • no. of side/s given: _____ • Law of _____	• no. of angle/s given: _____ • no. of side/s given: _____ • Law of _____

C. Determine the formulas for law of sines /law of cosines that can be used to find the missing in the given triangle.

Figure	Law of Sines	Law of Cosines
	✓ $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$ or ✓ $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$	✓ $a^2 = b^2 + c^2 - 2bc\cos A$ ✓ $b^2 = a^2 + c^2 - 2ac\cos B$ ✓ $c^2 = a^2 + b^2 - 2ab\cos C$

Figures	Possible formula that can be used:
1.) Find the missing angles and sides. 	Law of Cosine:
2.) Solve for a. 	Law of Sine:

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

DEVELOPMENTAL ACTIVITY SHEET

(Rossianee A. Estestes, Maricel E. Gindap, Emacil A. Bomea)

Level 1. Understanding the Role of Order in Permutation and Combination

Activity 1: Order or No order?

Directions: Look at each picture. Decide if order matters or not.
Write **P** for Permutation (**order**) or **C** for Combination (**no order**) next to each picture.

Picture	Order or No Order	Permutation or Combination
1. Halo-halo 	*No Order*	*C*
2. Alphabets 	*Order*	*P*
3. Picking the 1st, 2nd, and 3rd winners 		
4. Classroom officers 		
5. Selecting team 		
6. Selection of food 		
7. Assembling a jigsaw puzzle 		
8. Entering the PIN of your ATM card 		
9. Plate number NBC 1234		
10. Selection of clothes 		

Level 2. Classify and Represent Permutations and Combinations

Activity 2. P or C: Spot the rule!

Instructions: Read each situation. Decide whether it is a **permutation (P)** or **combination (C)**. Then, write the correct expression using P(n,r) or C(n,r).

Note:
Permutation= ${}_nP_r$ or P(n,r)
Combination = ${}_nC_r$ or C(n,r)

where: n= number of objects in set, r= number of chosen objects in set

GIVEN	SOLUTIONS
1. Choosing 2 leaders (president and vice president) from 6 students.	Permutation → P(6,2)
2. Selecting 3 students to join a club from 10 applicants.	Combination → C(10,3)
3. Forming a 4-digit code from the numbers 0–9 with no repetition.	
4. Picking 2 ice cream flavors out of 7 available options.	
5. Selecting 5 winners from 20 raffle entries (all winners are equal).	
6. A coach selects 6 players out of 15 to join the basketball team. The position they play does not matter yet.	
7. A school wants to assign 4 different project topics to 4 out of 10 students.	
8. Choosing 4 questions to answer out of 10 optional questions on an exam.	
9. You need to select and arrange 5 out of 12 artworks for a gallery display in a specific order.	
10. A password is created using 4 letters (no repeats) from the 26-letter alphabet.	

IM Implementation






PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION



Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato

CERTIFICATE
OF RECOGNITION
is awarded to

Anna Jean S. Garcia

For sharing her valuable knowledge and expertise as a **Resource Person** during the **"Seminar-workshop on Empowering Educators: Crafting Learning Materials and Implementing Design-Based Action Research"** held on May 30 - 31, 2025, at the Graduate School, University of Southern Mindanao, Kabacan, Cotabato.

GLYN B. GABANO- MAGBANUA, PhD
Director, Extension Services Office



Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato

CERTIFICATE
OF RECOGNITION
is awarded to

Debbie Marie B. Verzosa

For sharing her valuable knowledge and expertise as a **Resource Person** during the **"Seminar-workshop on Empowering Educators: Crafting Learning Materials and Implementing Design-Based Action Research"** held on May 30 - 31, 2025, at the Graduate School, University of Southern Mindanao, Kabacan, Cotabato.

GLYN B. GABANO- MAGBANUA, PhD
Director, Extension Services Office



Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato

CERTIFICATE
OF RECOGNITION
is awarded to

Leorence C. Tandog

For serving as the Facilitator during the **"Seminar-workshop on Zines as Alternative Pathways to Numeracy and Literacy: A Representation-Based Approach to Independent Learning"** held on November 8, 2025, at the Graduate School, University of Southern Mindanao, Kabacan, Cotabato.

GLYN B. GABANO- MAGBANUA, PhD
Director, Extension Services Office



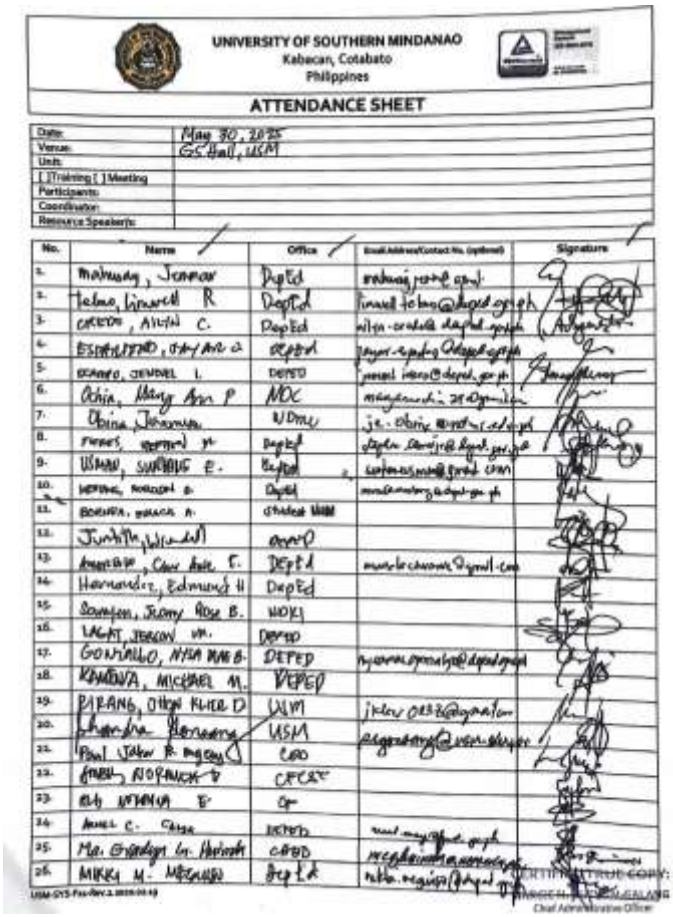
Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato

CERTIFICATE
OF RECOGNITION
is awarded to

Philip Lester P. Benjamin

For serving as the Facilitator during the **"Seminar-workshop on Empowering Educators: Crafting Learning Materials and Implementing Design-Based Action Research"** held on May 30 - 31, 2025, at the Graduate School, University of Southern Mindanao, Kabacan, Cotabato.

GLYN B. GABANO- MAGBANUA, PhD
Director, Extension Services Office



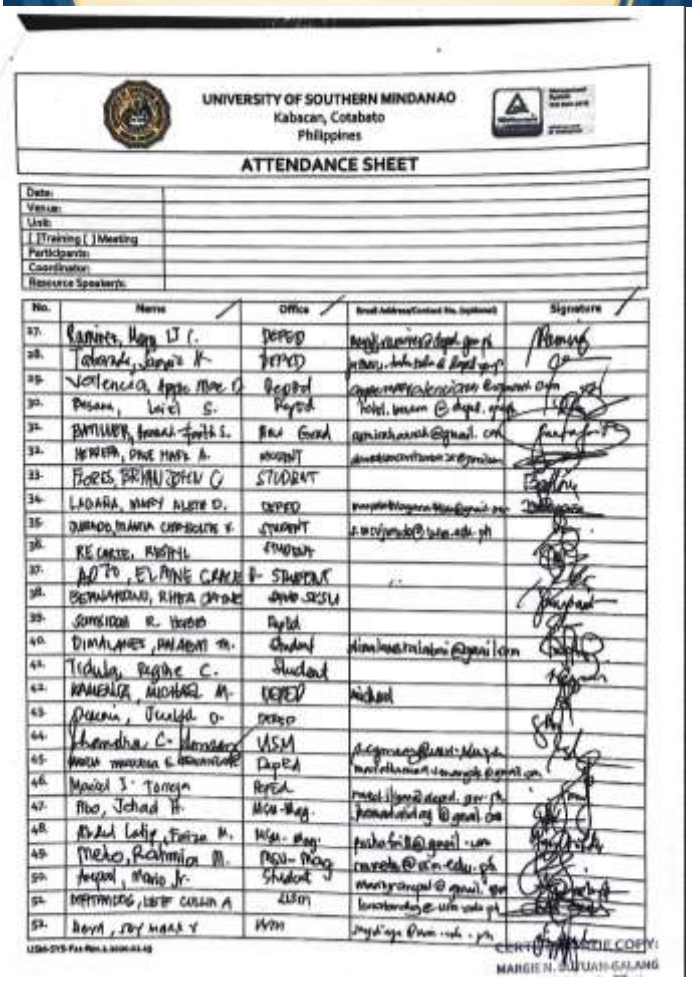
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

ATTENDANCE SHEET

Date:	May 30, 2025
Venue:	GS Hall, USM
Unit:	
[ ]Training [ ] Meeting	
Participants:	
Coordinator:	
Resource Speaker/s:	

No.	Name	Office	Email Address/Contact No. (optional)	Signature
1.	Mahinay, Jennifer	DepEd		
2.	Talino, Linawell R	DepEd		
3.	CREDO, Alicia C.	DepEd		
4.	ESPARTERO, Mary Ann C.	DepEd		
5.	RICARDO, JENNIEL L.	DEPED		
6.	Ochia, Mary Ann P	MDC		
7.	Obina, Johanna	U Dmc		
8.	FLORES, [illegible]	DepEd		
9.	USMAN, SUKAINA E.	DepEd		
10.	MERINO, ROSELYN G.	DepEd		
11.	BORRERO, GRACE A.	Student USM		
12.	[illegible]	[illegible]		
13.	[illegible], Cleo Ann E.	DepEd		
14.	Hernandez, Edmund H	DepEd		
15.	Sompon, Jhomy Rose B.	MDKI		
16.	LAGAT, JERICHO VN.	DEPED		
17.	GONIALLO, NYSA MAE B.	DEPED		
18.	KAMENTA, MICHAEL M.	DEPED		
19.	PARANG, OTHM KHER D	USM		
20.	Chandra Hernandez	USM		
21.	Paul John B. Bagay	CBD		
22.	[illegible]	CPCSE		
23.	[illegible]	[illegible]		
24.	[illegible]	DEPED		
25.	Ma. Gladys M. Hernandez	CBDD		
26.	MIKKI M. MERALLES	DepEd		

CERTIFIED TRUE COPY:
MARGIE N. SUAJAN-GALANG
Chief Administrative Officer



UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

ATTENDANCE SHEET

Date:	
Venue:	
Unit:	
[ ]Training [ ] Meeting	
Participants:	
Coordinator:	
Resource Speaker/s:	

No.	Name	Office	Email Address/Contact No. (optional)	Signature
27.	Ramirez, Mary Jo C.	DEPED		
28.	Talavera, Jessie K.	DEPED		
29.	Valencia, Agnes Mae O.	DepEd		
30.	Basana, Lorie S.	DepEd		
31.	BATTUNG, Hannah Faith S.	BM Guard		
32.	HERRERA, PAUL MARK A.	STUDENT		
33.	FLORES, BRIAN JOHN C.	STUDENT		
34.	LADAÑA, MARY ALICE D.	DEPED		
35.	DURADO, MARIA CHRISELLE V.	STUDENT		
36.	RE CARTE, RACHEL	STUDENT		
37.	AD TO, ELAINE GRACE P.	STUDENT		
38.	BETHANCOURT, RHEA [illegible]	[illegible]		
39.	SOMERIDA R. [illegible]	DepEd		
40.	DIMALANES, [illegible]	Student		
41.	Tagulao, Regine C.	Student		
42.	KAMENTA, MICHAEL M.	DEPED		
43.	Garcia, Jerald O.	DEPED		
44.	Chandra C. Hernandez	USM		
45.	[illegible]	DepEd		
46.	Maricel J. Tanoja	DepEd		
47.	Abo, Jehad H.	MSU-Mag.		
48.	Abdul Latip, Faize M.	MSU- Mag.		
49.	Mucho, Rahmina M.	MSU- Mag.		
50.	Amper, Mario Jr.	Student		
51.	MONTEMAYOR, LESTER CARLOS A.	USM		
52.	Bayn, Ray Mark Y.	MSM		

CERTIFIED TRUE COPY:
MARGIE N. SUAJAN-GALANG

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

Overall Training/Activity Evaluation

Training Detail

Name of Training: **Empowering Educators: Crafting Learning Materials and Design Implementing Design-Based Action Research**

Venue: **USM Graduate School**

Date: **May 30-31, 2025**

Particulars	Weighted Mean	Verbal Description
Course Content and Structure		
The objective of the activity was clearly stated at the beginning of the session	4.96	Excellent
The sequence of the topics was easy to follow	4.84	Excellent
There was sufficient time allocated for each topic	4.52	Excellent
The content of the session was clear and easy to understand	4.88	Excellent
Training Activities		
There was sufficient activities in the session	4.93	Excellent
The activities increased my knowledge and understanding	4.95	Excellent
The group activities encouraged my participation	4.81	Excellent
Methodology and Materials		
The instructional materials and presentation aids used helped me understand the topic better	4.62	Excellent
The delivery method (e.g. lecture training, FGD, forum) was suitable for the activity	4.72	Excellent
The delivery method assisted my learning and understanding	4.55	Excellent
Training Management Team, Facilities and Services		
The activity was well-organized and facilitated	4.43	Very Satisfactory
The secretariat was approachable and helpful	4.45	Very Satisfactory
The venue was conducive for the activity	4.51	Excellent

Rating Scale: 4.50-5.00 Excellent, 3.50-4.49 Very Satisfactory, 2.50-3.49 Satisfactory, 1.50-2.49 Fair, 1.00-1.49 Poor

SUMMARY OF RESOURCE PERSON/S' EVALUATION		Resource Person 1		Resource Person 2		Resource Person 3	
Item Code	Particulars	Weighted Mean	Verbal Description	Weighted Mean	Verbal Description	Weighted Mean	Verbal Description
1	The resource person displayed a thorough knowledge of the topic and was able to provide insights	4.76	Excellent	4.86	Excellent	5.00	Excellent
2	The resource person explained and processed the activities thoroughly	4.65	Excellent	4.79	Excellent	4.93	Excellent
3	The resource person sustained the attention of participants and encouraged their participation	4.43	VS	4.86	Excellent	5.00	Excellent
4	The resource person was able to create a good learning climate	4.62	Excellent	4.79	Excellent	4.97	Excellent
5	The resource person was able to manage their time well	4.73	Excellent	4.55	Excellent	4.93	Excellent
6	The resource person was sensitive to the participants' need	4.68	Excellent	4.83	Excellent	4.97	Excellent
	Total Mean Rating	4.65	Excellent	4.78	Excellent	4.97	Excellent

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

6. Budget



UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

BUDGET SUMMARY FOR EXTENSION

PROJECT TITLE	Strengthening Barangay High Schools' Validating and Implementing Representation Approach-Based Learning Materials for Independent Study of Mathematics in Remote Schools
PROPONENT:	LEORENCE C. TANDOG
FUND CLUSTER:	101
BUDGET ALLOCATION:	60,000.00

CODE	OBJECT OF EXPENDITURE	ESTIMATED BUDGET	ESTIMATED BUDGET												
			1ST Quarter			2nd Quarter			3rd Quarter			4th Quarter			TOTAL
			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
	I. PERSONNEL SERVICES (PS)														-
	A. Other Professional Services	10,000.00			1,500			1,500			1,500.00			5,500	10,000
	B. Other General services	25,000.00									15,000.00				15,000
	Sub-total for PS	35,000.00													-
															-
	II. MAINTENANCE AND OTHER OPERATING EXPENSES														-
	A. Procurement of Communication Supplies and Accessories	3,300.00			3,300.00										3,300
	B. Training Expense	11,173.60						11,173.60							11,174
	C. Office Supplies	2,026.40			2,026.40										2,026
	D. Procurement of Fuel, Oil, and Lubricants	4,400.00			4,400.00										4,400
	Sub-total for MOOE	25,000.00													-
															-
	TOTAL	60,000.00													60,000.00

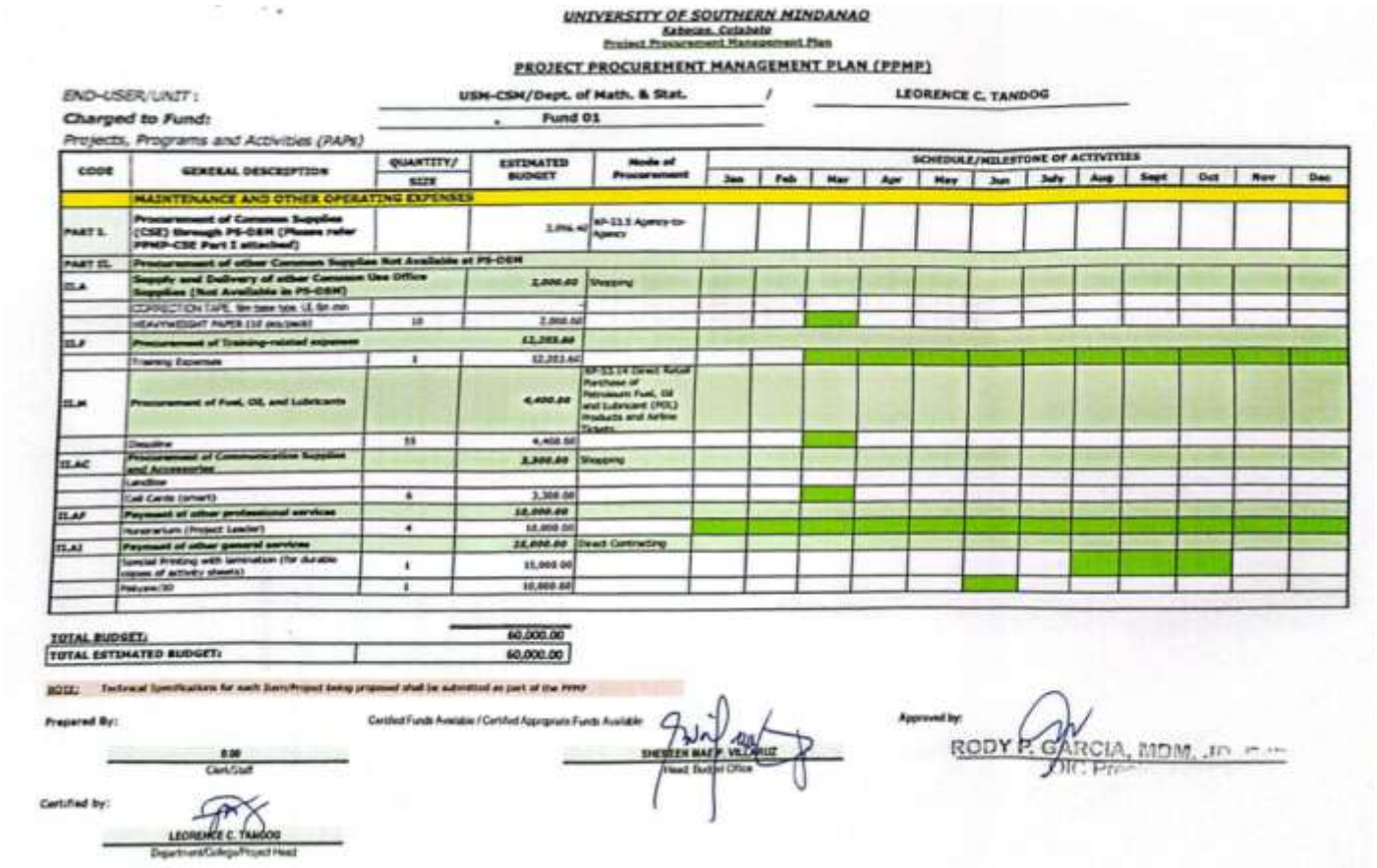
Prepared By:
LEORENCE C. TANDOG
Project Leader

Certified By:
GLYN G. MAGBAHUA, PhD
Director, ESO

Reviewed By:
SHEREEN MAE P. VILLARUZ
Budget Officer

Recommending Approval:
EINER M. ESTILLORE, EdD
VP for Administration & Finance
DEBBIE MARIE B. VERZOSA, PhD
VP for Research, Development and Extension

Approved By:
RODY P. GARCIA, MDM, JD, E-JD
OIC-President



UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Project Procurement Management Plan

PROJECT PROCUREMENT MANAGEMENT PLAN (PPMP)

END-USER/UNIT: USM-CSM/Dept. of Math. & Stat. / LEORENCE C. TANDOG
Charged to Fund: Fund 01
Projects, Programs and Activities (PAPs)

CODE	GENERAL DESCRIPTION	QUANTITY/ SIZE	ESTIMATED BUDGET	Mode of Procurement	SCHEDULE/MILESTONE OF ACTIVITIES											
					Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
	MAINTENANCE AND OTHER OPERATING EXPENSES															
PART I.	Procurement of Common Supplies (CSE) through PS-DBM (Please refer PPMP-CSE Part I attached)		3,094.40	RA-53.9 Agency-to-Agency												
PART II.	Procurement of other Common Supplies Not Available at PS-DBM															
II.A	Supply and Delivery of other Common Use Office Supplies (Not Available in PS-DBM)		2,000.00	Shopping												
	CORRECTION TAPE, 6m tape type, LE 6p mm		-													
	HEAVYWEIGHT PAPER 110 gm/sheet	10	2,000.00													
II.F	Procurement of Training-related expenses		11,293.60													
	Training Expenses	1	11,293.60													
II.M	Procurement of Fuel, Oil, and Lubricants		4,400.00	RA-53.14 Direct Retail Purchase of Petroleum Fuel, Oil and Lubricant (POL) Products and Airline Tickets												
	Gasoline	11	4,400.00													
II.AC	Procurement of Communication Supplies and Accessories		3,300.00	Shopping												
	Landline															
	Cell Cards (smart)	6	3,300.00													
II.AF	Payment of other professional services		10,000.00													
	Honorarium (Project Leader)	4	10,000.00													
II.AJ	Payment of other general services		25,000.00	Direct Contracting												
	Special Printing with lamination (for durable copies of activity sheets)	1	15,000.00													
	Palyaso/3D	1	10,000.00													

TOTAL BUDGET:	60,000.00
TOTAL ESTIMATED BUDGET:	60,000.00

NOTE: Technical Specifications for each Item/Project being proposed shall be submitted as part of the PPMP

Prepared By:
Clerk/Staff

Certified Funds Available / Certified Appropriate Funds Available
SHEREEN MAE P. VILLARUZ
Head Budget Office

Approved by:
RODY P. GARCIA, MDM, JD, E-JD
OIC-President

Certified by:
LEORENCE C. TANDOG
Department/College Project Head

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

7. Quarterly Report

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

QUARTERLY MONITORING AND EVALUATION REPORT FOR EXTENSION

Project Title:	**Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools**	**Period Covered**	☒ 1st Quarter ☐ 3rd Quarter ☐ 2nd Quarter ☐ 4th Quarter
Proponent(s):	Leorence C. Tandog, Debbie Marie B. Verzosa, Jonald L. Pimentel, Philip Lester P. Benjamin, Leonard M. Paleta, Anna Jean S. Garcia, Jupiter G. Pilongo, Daryl Mae C. Mamon, Rowel P. Madio, Roel S. Valenton, Sandra A. Nanding, Lawton John A. Yabes	**Fund Source**	☒ Local ___Fund 101_____ ☐ External _____

Activities *Based on the Work Plan Schedule*	**Outputs**	**Accomplishments** Target (%) *Based on the Milestone in the Workplan*	**Accomplishments** Actual (%)	**(%) Completion (Cumulative)**	**Problems Encountered** *(if any)*	**Action Taken**	**Fund Utilization (%)**	**Remarks by Evaluator**
% Completion (Cumulative) from the previous quarter: 0%								
1. Building Capacity of Teachers in Instructional Material Development (one day)	Training design, workshop schedule and venue, committee in charge, processed COPD application	10%	0%	0%	Conflict of schedule, DepEd teachers and faculty were busy at the time, near semester end.	Training will be conducted together with the next capacity-building activity to allow more preparation time.	0%	
2. Development of Representation Approach-Based Learning Materials for Independent Learning of Mathematics	Diagnostic test result, some baseline information, PhD students identified topics for IM development and lesson study.	40%	0%	0%	Cannot proceed because the training on capacity must come first.	Activity postponed until capacity-building training is completed.	0%	

Prepared by:	Noted by:	Evaluated by:	Concurred by:
LEORENCE C. TANDOG, PhD	**CHERIE C. MANGAOANG, PhD**	**GLYN G. MAGBANUA, PhD**	**DEBBIE MARIE B. VERZOSA, PhD**
Project Leader	College Extension Coordinator	Director, Extension Services Office	Vice President for Research, Development and Extension

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

QUARTERLY MONITORING AND EVALUATION REPORT FOR EXTENSION

Project Title:	**Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools**	**Period Covered**	☒ 1st Quarter ☐ 3rd Quarter ☒ 2nd Quarter ☐ 4th Quarter
Proponent(s):	Leorence C. Tandog, Debbie Marie B. Verzosa, Jonald L. Pimentel, Philip Lester P. Benjamin, Leonard M. Paleta, Anna Jean S. Garcia, Jupiter G. Pilongo, Daryl Mae C. Mamon, Rowel P. Madio, Roel S. Valenton, Sandra A. Nanding, Lawton John A. Yabes	**Fund Source**	☒ Local ___Fund 101_____ ☐ External _____

Activities *Based on the Work Plan Schedule*	**Outputs**	**Accomplishments** Target (%) *Based on the Milestone in the Workplan*	**Accomplishments** Actual (%)	**(%) Completion (Cumulative)**	**Problems Encountered** *(if any)*	**Action Taken**	**Fund Utilization (%)**	**Remarks by Evaluator**
% Completion (Cumulative) from the previous quarter: 0 %								
1. Building Capacity of Teachers in Instructional Material Development (one day)	Training design, workshop schedule and venue, committee in charge, processed COPD application	10%	100%	10%	None	None	25.84%	
2. Development of Representation Approach-Based Learning Materials for Independent Learning of Mathematics (two months)	Diagnostic test result, some baseline information, PhD students identified topics for IM development and lesson study.	40%	100%	50%	None	None		
3. Validation and Packaging of Representation Approach-Based Learning Materials for Independent Learning of Mathematics (two months)	validated and packaged LMAPS	20%	100	70%	None	None		

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

QUARTERLY MONITORING AND EVALUATION REPORT FOR EXTENSION

4. Building Capacity of Teachers on Action Research (one day)	Training design, workshop schedule and venue, committee in charge, processed COPD application	10%	100%	80%	None	None		

Prepared by:
LEORENCE C. TANDOG, PhD
Project Leader

Noted by:
CHERIE C. MANGAOANG, PhD
College Extension Coordinator

Evaluated by:
GLYN G. MAGBANUA, PhD
Director, Extension Services Office

Concurred by:
DEBBIE MARIE B. VERZOSA, PhD
Vice President for Research, Development and Extension

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

QUARTERLY MONITORING AND EVALUATION REPORT FOR EXTENSION

Project Title:	**Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools**	**Period Covered**	☒ 1st Quarter ☒ 3rd Quarter ☒ 2nd Quarter ☐ 4th Quarter
Proponent(s):	Leorence C. Tandog, Debbie Marie B. Verzosa, Jonald L. Pimentel, Philip Lester P. Benjamin, Leonard M. Paleta, Anna Jean S. Garcia, Jupiter G. Pilongo, Daryl Mae C. Mamon, Rowel P. Madio, Roel S. Valenton, Sandra A. Nanding, Lawton John A. Yabes	**Fund Source**	☒ Local ___Fund 101___ ☐ External _____

Activities *Based on the Work Plan Schedule*	Outputs	Accomplishments: Target (%) *Based on the Milestone in the Workplan*	Accomplishments: Actual (%)	(%) Completion (Cumulative)	Problems Encountered *(if any)*	Action Taken	Fund Utilization (%)	Remarks by Evaluator
% Completion (Cumulative) from the previous quarter: 80%								
5. Implementation of Representation Approach-Based Learning Materials for Improved Learning of General Mathematics (two months)	Deployment & use of LMAPS by target beneficiaries	20%	75%	95%	None	None	40%	

Prepared by:
LEORENCE C. TANDOG, PhD
Project Leader

Noted by:
CHERIE C. MANGAOANG, PhD
College Extension Coordinator

Evaluated by:
GLYN G. MAGBANUA, PhD
Director, Extension Services Office

Concurred by:
DEBBIE MARIE B. VERZOSA, PhD
Vice President for Research, Development and Extension

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

QUARTERLY MONITORING AND EVALUATION REPORT FOR EXTENSION

Project Title:	**Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools**	**Period Covered**	☒ 1st Quarter ☒ 3rd Quarter ☒ 2nd Quarter ☒ 4th Quarter
Proponent(s):	Leorence C. Tandog, Debbie Marie B. Verzosa, Jonald L. Pimentel, Philip Lester P. Benjamin, Leonard M. Paleta, Anna Jean S. Garcia, Jupiter G. Pilongo, Daryl Mae C. Mamon, Rowel P. Madio, Roel S. Valenton, Sandra A. Nanding, Lawton John A. Yabes	**Fund Source**	☒ Local ___Fund 101___ ☐ External _____

Activities *Based on the Work Plan Schedule*	Outputs	Accomplishments: Target (%) *Based on the Milestone in the Workplan*	Accomplishments: Actual (%)	(%) Completion (Cumulative)	Problems Encountered *(if any)*	Action Taken	Fund Utilization (%)	Remarks by Evaluator
% Completion (Cumulative) from the previous quarter: 95%								
5. Implementation of Representation Approach-Based Learning Materials for Improved Learning of General Mathematics (two months)	Deployment & use of LMAPS by target beneficiaries	20%	100%	100%	None	None	67%	

Prepared by:
LEORENCE C. TANDOG, PhD
Project Leader

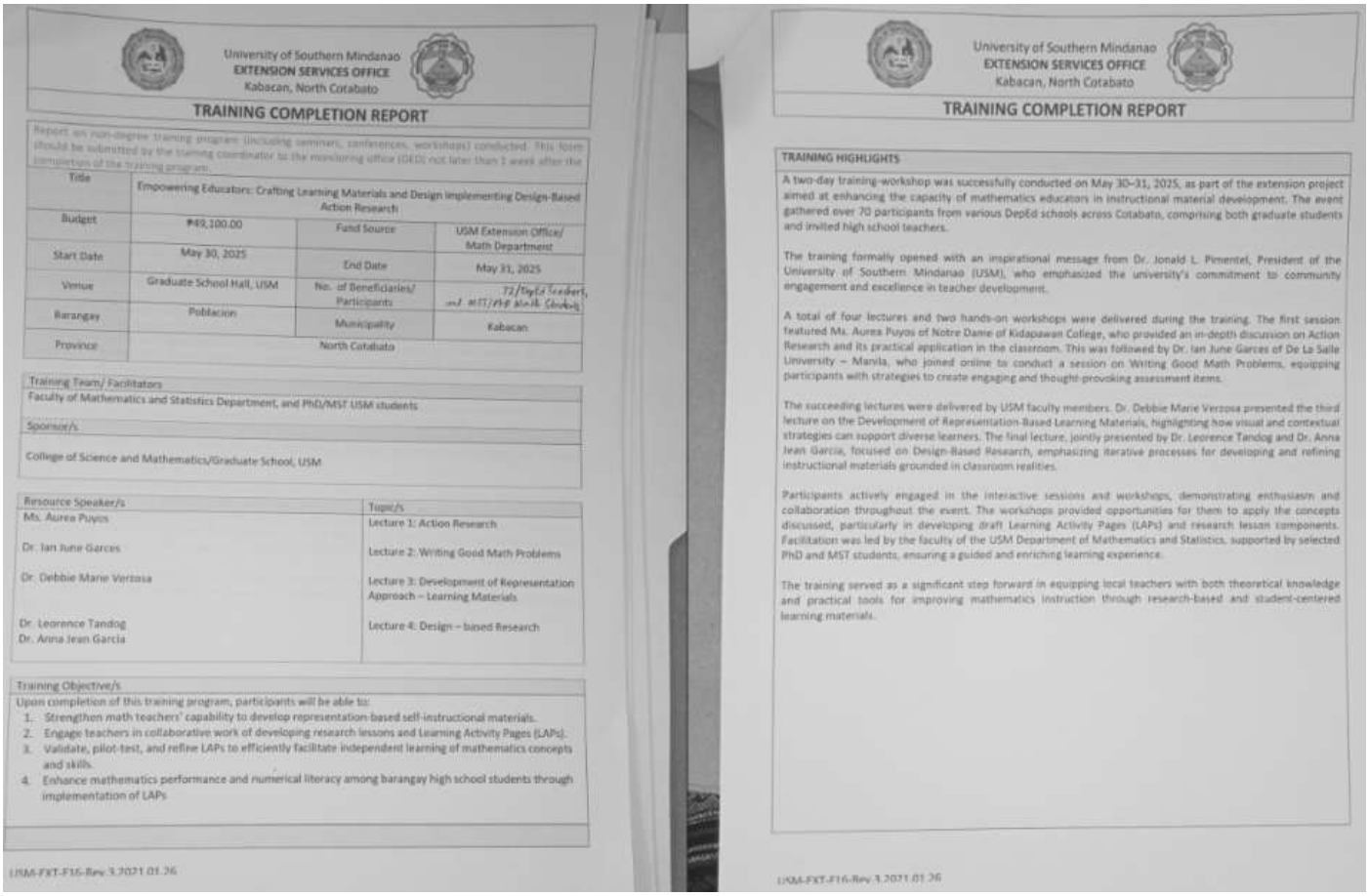
Noted by:
CHERIE C. MANGAOANG, PhD
College Extension Coordinator

Evaluated by:
GLYN G. MAGBANUA, PhD
Director, Extension Services Office

Concurred by:
DEBBIE MARIE B. VERZOSA, PhD
Vice President for Research, Development and Extension

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

8. Training Completion Report



University of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

TRAINING COMPLETION REPORT

Report on non-degree training program (including seminars, conferences, workshops) conducted. This form should be submitted by the training coordinator to the monitoring office (OED) not later than 1 week after the completion of the training program.

Title	Empowering Educators: Crafting Learning Materials and Design Implementing Design-Based Action Research		
Budget	₱49,100.00	Fund Source	USM Extension Office/ Math Department
Start Date	May 30, 2025	End Date	May 31, 2025
Venue	Graduate School Hall, USM	No. of Beneficiaries/ Participants	72/Hybrid Teachers, and MST/PhD Math Students
Barangay	Poblacion	Municipality	Kabacan
Province	North Cotabato		

Training Team/ Facilitators
Faculty of Mathematics and Statistics Department, and PhD/MST USM students

Sponsor/s
College of Science and Mathematics/Graduate School, USM

Resource Speaker/s	Topic/s
Ms. Aurea Puyos	Lecture 1: Action Research
Dr. Ian June Garces	Lecture 2: Writing Good Math Problems
Dr. Debbie Marie Verzosa	Lecture 3: Development of Representation Approach – Learning Materials
Dr. Leorence Tandog Dr. Anna Jean Garcia	Lecture 4: Design – based Research

Training Objective/s
Upon completion of this training program, participants will be able to:
1. Strengthen math teachers' capability to develop representation-based self-instructional materials.
2. Engage teachers in collaborative work of developing research lessons and Learning Activity Pages (LAPs).
3. Validate, pilot-test, and refine LAPs to efficiently facilitate independent learning of mathematics concepts and skills.
4. Enhance mathematics performance and numerical literacy among barangay high school students through implementation of LAPs

USM-EXT-F16-Rev 3 2021.01.26

University of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

TRAINING COMPLETION REPORT

TRAINING HIGHLIGHTS

A two-day training-workshop was successfully conducted on May 30–31, 2025, as part of the extension project aimed at enhancing the capacity of mathematics educators in instructional material development. The event gathered over 70 participants from various DepEd schools across Cotabato, comprising both graduate students and invited high school teachers.

The training formally opened with an inspirational message from Dr. Jonald L. Pimentel, President of the University of Southern Mindanao (USM), who emphasized the university's commitment to community engagement and excellence in teacher development.

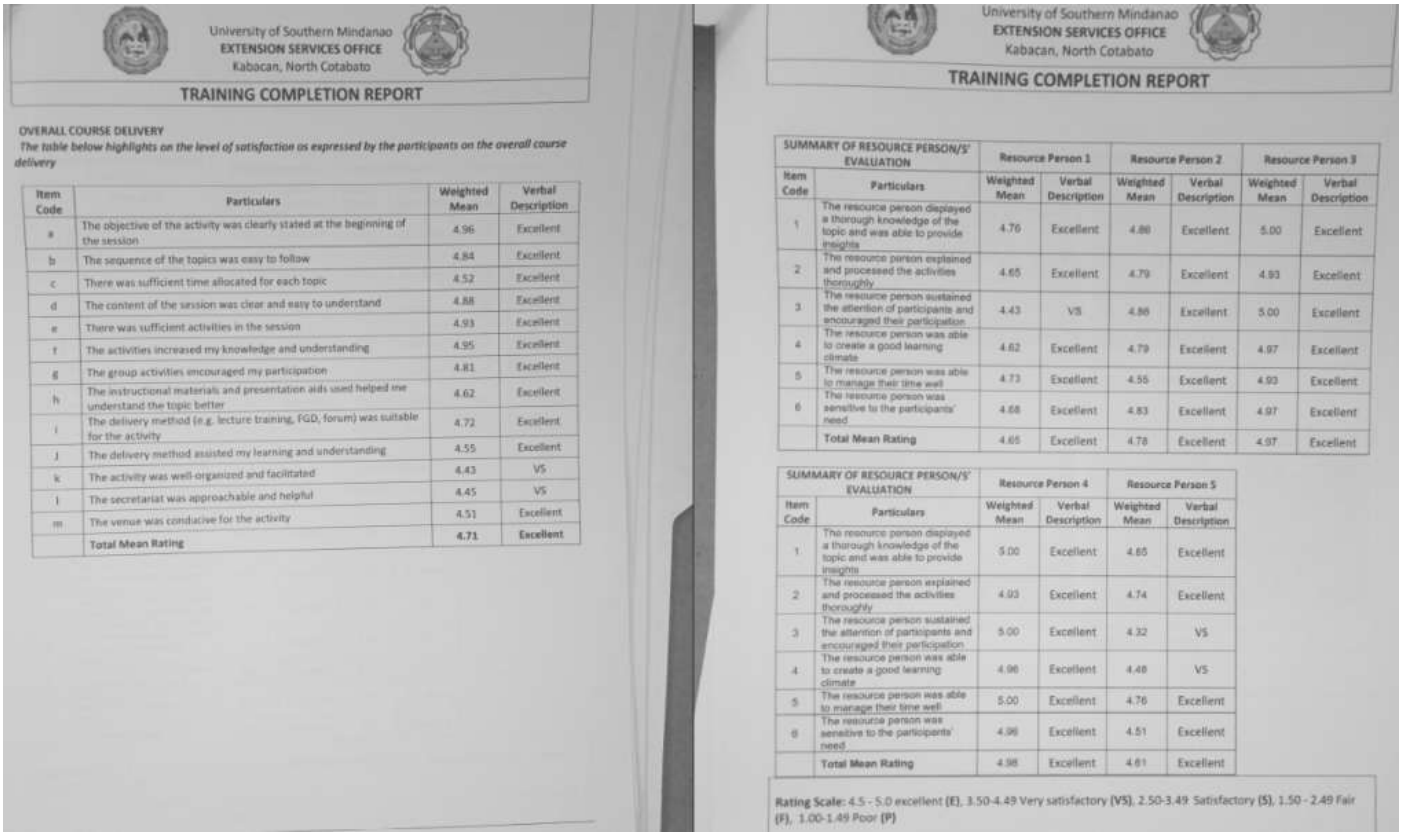
A total of four lectures and two hands-on workshops were delivered during the training. The first session featured Ms. Aurea Puyos of Notre Dame of Kidapawan College, who provided an in-depth discussion on Action Research and its practical application in the classroom. This was followed by Dr. Ian June Garces of De La Salle University – Manila, who joined online to conduct a session on Writing Good Math Problems, equipping participants with strategies to create engaging and thought-provoking assessment items.

The succeeding lectures were delivered by USM faculty members. Dr. Debbie Marie Verzosa presented the third lecture on the Development of Representation-Based Learning Materials, highlighting how visual and contextual strategies can support diverse learners. The final lecture, jointly presented by Dr. Leorence Tandog and Dr. Anna Jean Garcia, focused on Design-Based Research, emphasizing iterative processes for developing and refining instructional materials grounded in classroom realities.

Participants actively engaged in the interactive sessions and workshops, demonstrating enthusiasm and collaboration throughout the event. The workshops provided opportunities for them to apply the concepts discussed, particularly in developing draft Learning Activity Pages (LAPs) and research lesson components. Facilitation was led by the faculty of the USM Department of Mathematics and Statistics, supported by selected PhD and MST students, ensuring a guided and enriching learning experience.

The training served as a significant step forward in equipping local teachers with both theoretical knowledge and practical tools for improving mathematics instruction through research-based and student-centered learning materials.

USM-EXT-F16-Rev 3 2021.01.26



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TRAINING COMPLETION REPORT

OVERALL COURSE DELIVERY

The table below highlights on the level of satisfaction as expressed by the participants on the overall course delivery

Item Code	Particulars	Weighted Mean	Verbal Description
a	The objective of the activity was clearly stated at the beginning of the session	4.96	Excellent
b	The sequence of the topics was easy to follow	4.84	Excellent
c	There was sufficient time allocated for each topic	4.52	Excellent
d	The content of the session was clear and easy to understand	4.88	Excellent
e	There was sufficient activities in the session	4.93	Excellent
f	The activities increased my knowledge and understanding	4.95	Excellent
g	The group activities encouraged my participation	4.81	Excellent
h	The instructional materials and presentation aids used helped me understand the topic better	4.62	Excellent
i	The delivery method (e.g. lecture training, FGD, forum) was suitable for the activity	4.72	Excellent
j	The delivery method assisted my learning and understanding	4.55	Excellent
k	The activity was well-organized and facilitated	4.43	VS
l	The secretariat was approachable and helpful	4.45	VS
m	The venue was conducive for the activity	4.51	Excellent
	Total Mean Rating	**4.71**	**Excellent**

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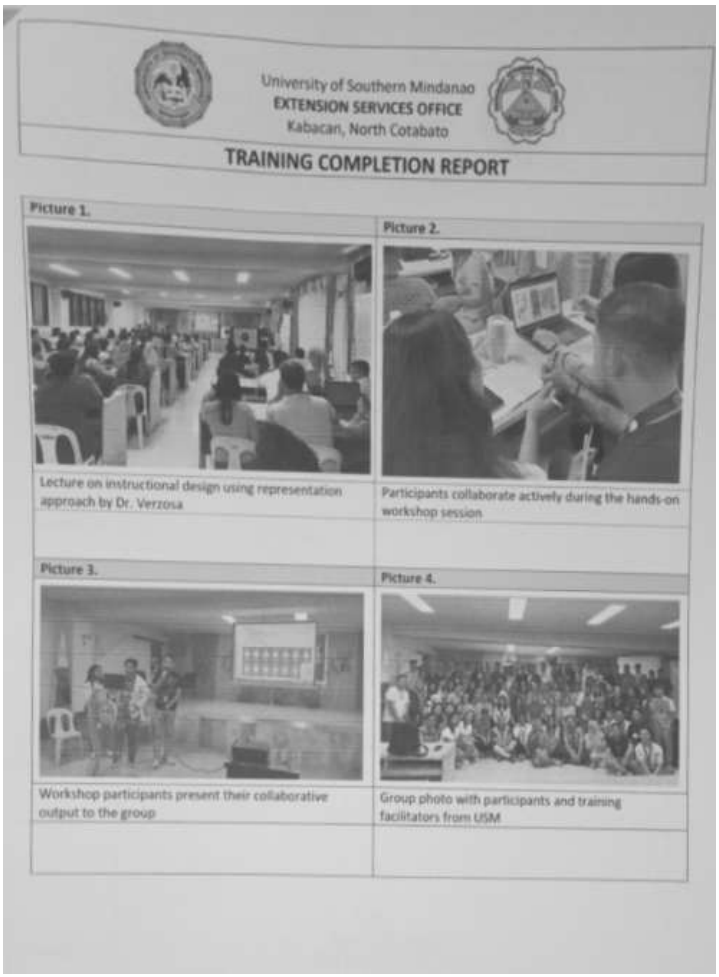
TRAINING COMPLETION REPORT

SUMMARY OF RESOURCE PERSON/S' EVALUATION		Resource Person 1		Resource Person 2		Resource Person 3	
Item Code	Particulars	Weighted Mean	Verbal Description	Weighted Mean	Verbal Description	Weighted Mean	Verbal Description
1	The resource person displayed a thorough knowledge of the topic and was able to provide insights	4.76	Excellent	4.86	Excellent	5.00	Excellent
2	The resource person explained and processed the activities thoroughly	4.65	Excellent	4.79	Excellent	4.93	Excellent
3	The resource person sustained the attention of participants and encouraged their participation	4.43	VS	4.86	Excellent	5.00	Excellent
4	The resource person was able to create a good learning climate	4.62	Excellent	4.79	Excellent	4.97	Excellent
5	The resource person was able to manage their time well	4.73	Excellent	4.55	Excellent	4.93	Excellent
6	The resource person was sensitive to the participants' need	4.68	Excellent	4.83	Excellent	4.97	Excellent
	Total Mean Rating	4.65	Excellent	4.78	Excellent	4.97	Excellent

SUMMARY OF RESOURCE PERSON/S' EVALUATION		Resource Person 4		Resource Person 5	
Item Code	Particulars	Weighted Mean	Verbal Description	Weighted Mean	Verbal Description
1	The resource person displayed a thorough knowledge of the topic and was able to provide insights	5.00	Excellent	4.85	Excellent
2	The resource person explained and processed the activities thoroughly	4.93	Excellent	4.74	Excellent
3	The resource person sustained the attention of participants and encouraged their participation	5.00	Excellent	4.32	VS
4	The resource person was able to create a good learning climate	4.96	Excellent	4.48	VS
5	The resource person was able to manage their time well	5.00	Excellent	4.76	Excellent
6	The resource person was sensitive to the participants' need	4.96	Excellent	4.51	Excellent
	Total Mean Rating	4.98	Excellent	4.61	Excellent

Rating Scale: 4.5 - 5.0 excellent **(E)**, 3.50-4.49 Very satisfactory **(VS)**, 2.50-3.49 Satisfactory **(S)**, 1.50 - 2.49 Fair **(F)**, 1.00-1.49 Poor **(P)**

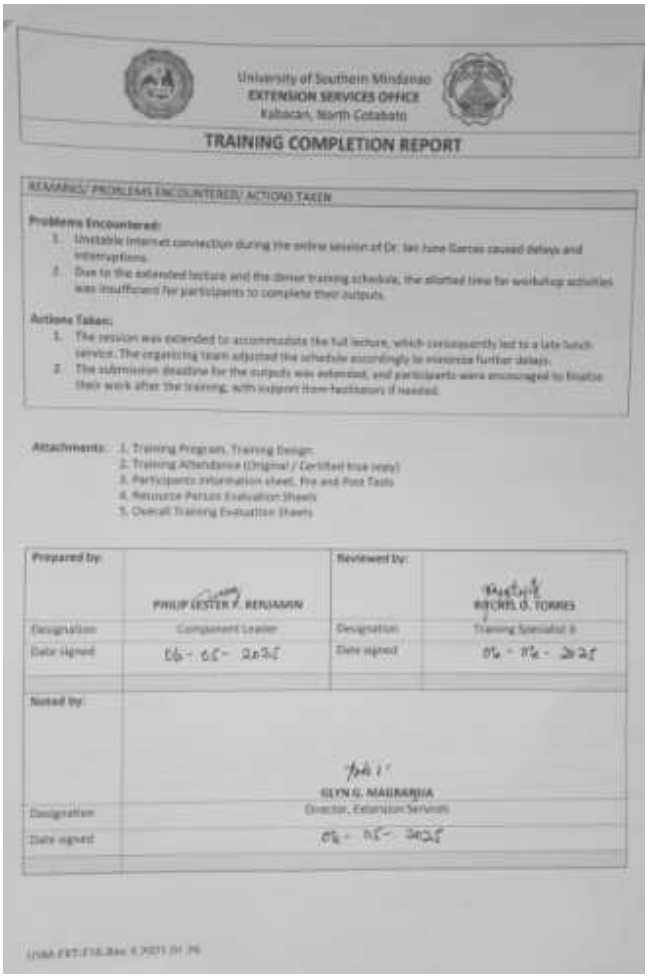
PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION



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TRAINING COMPLETION REPORT

Picture 1.	Picture 2.
Lecture on instructional design using representation approach by Dr. Verzosa	Participants collaborate actively during the hands-on workshop session
Picture 3.	**Picture 4.**
Workshop participants present their collaborative output to the group	Group photo with participants and training facilitators from USM



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TRAINING COMPLETION REPORT

REMARKS/ PROBLEMS ENCOUNTERED/ ACTIONS TAKEN

Problems Encountered:

1. Unstable internet connection during the online session of Dr. Ian June Garces caused delays and interruptions.
2. Due to the extended lecture and the dense training schedule, the allotted time for workshop activities was insufficient for participants to complete their outputs.

Actions Taken:

1. The session was extended to accommodate the full lecture, which consequently led to a late lunch service. The organizing team adjusted the schedule accordingly to minimize further delays.
2. The submission deadline for the outputs was extended, and participants were encouraged to finalize their work after the training, with support from facilitators if needed.

Attachments: 1. Training Program, Training Design
2. Training Attendance (Original / Certified true copy)
3. Participants information sheet, Pre and Post Tests
4. Resource Person Evaluation Sheets
5. Overall Training Evaluation Sheets

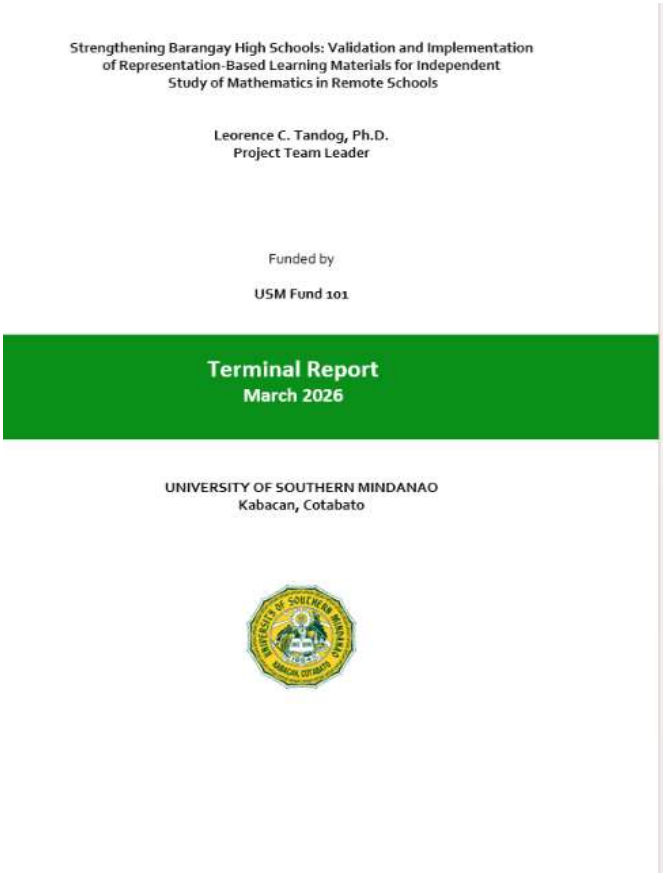
Prepared by:	PHILIP LESTER F. BENJAMIN	Reviewed by:	RECHEL O. TORRES
Designation	Component Leader	Designation	Training Specialist II
Date signed	06 - 05 - 2025	Date signed	06 - 06 - 2025

Noted by:

GLYN G. MAGBANUA
Director, Extension Services

Date signed: 06 - 05 - 2025

9. Terminal Report



Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools

Leorence C. Tandog, Ph.D.
Project Team Leader

Funded by

USM Fund 101

Terminal Report
March 2026

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato

ABSTRACT

Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools

Project members: *Leorence Tandog, Shandra Nanding, Philip Lester Benjamin, Jupiter Pilongo, Rowel Madio, Lawton Yabes, Dominic Carajay, Lidey Sultan, Debbie Marie Verzosa, Jonald Pimentel, Leonard Paleta, Anna Jean Sebastian, Daryl Mae Catubig, Jeanette Licaros, Roel Valenton, Jennifer Pama, Arnel Toledo, DOST-SEI Project Strand-N Scholars, MST and PhD Ed Math Students*

This extension project aimed to improve mathematics learning in barangay high schools, with Salvacion High School in Cotabato serving as the primary beneficiary, through the development and implementation of representation-based, self-instructional learning materials. The project responded to persistent challenges faced by barangay high schools in the Philippines, including the shortage of qualified teachers, limited instructional resources, and consistently low performance in national achievement assessments. It built on a research initiative launched in 2021 that introduced representation-based instructional materials, which demonstrated positive effects on students' understanding of mathematics and science.

The project engaged faculty members and graduate students from the PhD in Education and MST in Mathematics programs in collaborative lesson study, materials development, and action research. A systematic implementation process was followed, which included baseline data collection, teacher training, material development, validation and refinement, and classroom implementation. As a result, the project produced Learning Activity Pages (LAPs) designed to support independent learning and address identified learning gaps in mathematics in a remote area.

The implementation was conducted at Salvacion High School with the active support of the teachers and the school heads. The effectiveness of the intervention was assessed using pre- and post-tests on mathematical achievement and numeracy, student feedback, and teacher observations. Findings indicated a significant improvement in the numeracy skills of the student respondents, particularly in the various mathematical thinking skills. Moreover, the school beneficiary demonstrated enhanced overall performance, as reflected in their better rankings in district-wide competitions and increase in the number of senior high school students who qualified to enroll at USM based on USMCEE score.

The results of the project provided empirical evidence to support further refinement and possible scaling of the developed materials for use in other low-resource educational settings. Overall, the project contributed to the advancement of inclusive, equitable, and quality education by empowering students and teachers through accessible, research-based, and context-responsive learning resources.

Keywords: *Representation-Based Learning, Self-Instructional Materials, Learning Activity Sheets, Mathematics Education, Barangay High Schools*

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UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Philippines

A. BASIC INFORMATION		
1. Title	Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools	
2. Status	☐ Ongoing ☐ Completed	
3. Project Leader Study Leader	**Dr. Leorence C. Tandog** College of Science and Mathematics	
Email Address	lctandog@usm.edu.ph	
Contact Number	09466115568	
4. Lead Unit/College	College of Science and Mathematics	
Collaborating Unit/College	DepEd Cotabato Division	
5. Category	☐ Program ☑ Project ☐ Study	
6. Classification	☐ Research	☐ Development ☑ Extension
	☐ Basic ☐ Applied	☐ Pilot Testing ☐ Prototype Development ☐ Tech. Promotion/Commercialization
7. Thematic Area	☑ Quality Learning, Skills Development, and Literacy ☐ Social Development, and Strong Institutions ☐ Preservation of Culture ☐ Environmental Protection, Conservation, and Risk Reduction ☐ Food Security and Poverty Reduction ☐ Good Health and Well-being ☐ Innovations in Science, Engineering, and Technology ☐ Sustainable Entrepreneurship and Management	
8. Sustainable and Development Goals	☐ No Poverty ☐ Zero Hunger ☐ Good Health & Well-Being ☑ Quality Education ☐ Gender Equality ☐ Clean Water & Sanitation ☐ Affordable and Clean Energy ☐ Decent Work & Economic Growth ☐ Industry Innovation & Infrastructure	☐ Reduced Inequalities ☐ Sustainable Cities & Communities ☐ Responsible Consumption & Production ☐ Climate Action ☐ Life Below Water ☐ Life on Land ☐ Peace, Justice and Strong Institutions ☐ Partnership for the Goals
9. Project Duration	One year	
10. Project Location	Matalam, Cotabato	
11. Total Budget	PhP 60,000	

TERMINAL REPORT

B. TECHNICAL DESCRIPTION

1. Rationale / Significance

Rationale

The performance of Philippine barangay high schools has long been perceived as inferior due to persistent challenges—foremost among them is the lack of qualified teachers. Teacher shortage is a critical issue in many rural areas globally but is particularly acute in barangay schools. These institutions often serve as entry points for novice teachers who are frequently assigned to teach out-of-field subjects due to staffing limitations and the small number of class sections typically offered in remote locations. Serving predominantly underprivileged and marginalized communities, barangay schools are often overlooked in favor of larger, better-resourced institutions.

In 2021, our team initiated a multi-dimensional response to the urgent educational disruptions brought about by the COVID-19 pandemic. This involved the development of instructional materials and technological tools designed to support student learning under constrained conditions. We introduced teaching innovations that featured interactive elements, visual aids, and manipulable representations. These efforts resulted in notable improvements in students' understanding of mathematics and science concepts.

Building on the success of that initiative, faculty members and graduate students from the PhD in Education and MST major in Mathematics programs engaged in a collaborative lesson study. This led to the development of research-based lessons and Learning Activity Pages (LAPs) that employ multiple representational approaches. These materials are designed to enable students to grasp essential concepts and skills even with minimal teacher supervision—or in the absence of a teacher altogether.

With these resources now prepared for validation, this extension project seeks to address the unique educational challenges faced by barangay schools through their strategic deployment and use.

Significance

This extension project was significant in addressing the persistent teacher shortage in barangay schools through the development of learning materials (LMs) that support independent learning. These materials were contextualized to reflect the realities of local school settings and the mathematical deficiencies of target learners, making them more relevant and responsive to the needs of barangay students. The initiative contributed to the long-term improvement of barangay high schools by enhancing instruction through the use of high-quality, research-based resources.

In addition to promoting content mastery, the materials foster lifelong learning by integrating soft skills such as number sense, critical thinking, problem-solving, and self-efficacy. These competencies continue to prepare students for real-world challenges and academic success. The project also aimed to enhance students' chances of admission to tertiary education, a critical pathway to socio-economic advancement and improved quality of life, particularly for learners in remote areas.

Grounded in lesson study and collaborative educational research conducted by faculty members of the Mathematics Department and graduate students, the project supported professional development and strengthened academic–community partnerships.

Furthermore, this initiative aligned with the broader goal of achieving inclusive and equitable quality education. The approach and materials can be adapted for use in other low-resource schools across the country, positioning the project as a potential model for broader implementation. By supporting barangay high schools, this project helps ensure that Filipino learners have access to meaningful and quality learning experiences, regardless of their geographic location.

Objectives

This project aimed to enhance the mathematics education received by students in barangay high schools in DepEd Cotabato with the use of carefully designed and validated self-instructional LMs.

The specific objectives of the extension project were to:

1. **strengthen** mathematics teachers' capacity to develop representation-based, self-instructional materials and to conduct action research or design-based research using these materials;
2. **engage** teachers in the collaborative development of research lessons and the design of self-instructional learning materials (LMs) in the form of Learning Activity Pages (LAPs);
3. **validate, pilot-test, and refine** activity sheets to effectively facilitate independent learning of mathematics concepts and skills;
4. **enhance** mathematics performance and numerical literacy among barangay high school students through the implementation of action research using the developed instructional materials; and
5. **improve** the overall performance of the target school and increase the chances of its senior high school (SHS) students being admitted to the University of Southern Mindanao (USM).

2. Review of Related Literature

Barangay high schools, formerly known as barrio high schools, were established in 1964 to provide wider access to secondary education (Orata, 1979). Since then, additional barangay high schools have opened with the passage of RA 6054 or the "Barrio High School Charter" in 1969. The establishment of barangay high schools is considered as equalizing opportunity for all Filipino children to access education regardless of their place of residence or economic condition.

The performance of Philippine barangay schools has always been viewed to be inferior. In 1987 the Department of Education (DepEd) temporarily halted the opening of barangay high schools with acknowledgement that the quality of instruction in most of the barangay high schools suffered as evidenced by poor results in national achievement tests (DepEd DO 69, s. 1987).

Self-regulated and independent study is vital in cases where teachers are not available to facilitate learning. Effective LMs significantly support independent learning since resources that can be learned without needing the assistance of a teacher can empower students to take control of their studies, learn at their own pace, and develop self-discipline and independent thinking. Research shows that supplemental printed materials significantly facilitate successful learning of math concepts (Brown and Gilmer, 2009) and self-instructional worked examples are effective in the development of both conceptual and procedural knowledge (Sheldon, 2013).

In 2021, we initiated a multi-dimensional approach to respond to the challenges that emerged from the urgent educational adaptations driven by the pandemic through material and technology tools development (Tandog & Verzosa, 2021). Our project introduced teaching innovations that utilized interactive elements, visual features, storytelling, and manipulable representations. Various studies have shown that these features and tools enhance learning (De las Peñas & Bautista, 2008), facilitate visualization (Taka, Taka, & Budinski, 2010), and develop creativity (Shelomovskiy & Nosulya, 2012). Representation is an important element in the study of mathematics and is considered at the heart of cognitions associated with mathematical activity (Kaput, 1987).

3. Methodology

A. Development Phase

1. Baseline Data Collection / Needs Assessment

Surveys were conducted on school performance and admission SHS graduates to college to profile Salvacion High School. Ocular visits and interviews with teachers and school heads assessed existing learning resources, identified students' learning gaps, and considered contextual factors for project implementation. A diagnostic pretest was also administered to determine specific student needs to guide material development.

2. Planning and Training

An orientation introduced project goals, and the learning needs to be addressed. Training was conducted on the representation approach, scaffolding techniques, action research, and design-based research to support teachers in material development. Plans of activities for developing, reviewing, validating, and pilot-testing instructional materials were prepared.

3. Development, Validation, Pilot Testing, and Refinement

Instructional materials were developed collaboratively by MST and PhD students with

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faculty of the Mathematics and Statistics Department as subject experts. Faculty and students validated the content, and pilot testing involved selected high school students to assess engagement and learning outcomes. Materials were refined using feedback from needs assessment, validation, and pilot testing to suit students' capabilities and curriculum requirements.

4. Packaging and Reproduction of LAPs

Final layouts considered cost-efficiency, readability, and usability. LAPs were reproduced for target beneficiaries, and implementation feedback informed refinement for potential future use, patenting, and wider dissemination.

C. Implementation Phase

The project was implemented at Salvacion High School, an annex of Kibia High School. Support was provided to teachers and the TIC during student engagement, outputs were evaluated to guide ongoing support, and action research assessed improvements in learning outcomes.

D. Evaluation Phase

Project effectiveness was measured through comparison of pretest and posttest scores, student outputs, and teacher observations. Student feedback was gathered through interviews and focus groups. Impact on school operations was assessed via principal and teachers' narratives on how the materials addressed teacher scarcity and improved school performance.

4. Results and Discussion

Baseline data

An ocular site visit and interviews conducted with the teachers and the former Principal of Salvacion High School at the start of the extension project revealed critical gaps in instructional support for mathematics education. One of the most pressing issues identified was the lack of learning resources, particularly in mathematics, as the Department of Education (DepEd) has been unable to provide textbooks for the subject. Additionally, it was found that none of the teachers in junior high school specialized in mathematics. Instead, mathematics classes are handled by teachers with academic backgrounds in Science and Filipino, underscoring the urgent need for subject-specific instructional support.



Figure 1. MST Math students and Salvacion HS teachers during initial site visit

Secondary data on the results of the Rapid Mathematics Assessment (RMA) for Grades 7–10 at Salvacion High School revealed that none of the students in the partner school demonstrated proficiency in the cognitive domain at their current grade level. This finding aligns with the recently released EDCOM 2 report, which indicated that only 0.40% of Grade 12 students in the Philippines attained the minimum level of competency (Second Congressional Commission on Education [EDCOM II], 2026). The RMA further revealed that most of the target students, despite being in high school, possess mathematics competencies equivalent to Grade 2 level, with the highest observed competency reaching only up to Grade 4 level.

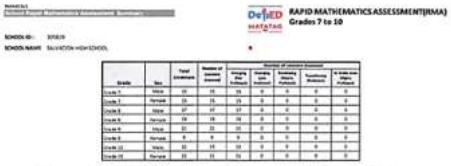


Figure 2. Rapid Mathematics Assessment Result for Grades 7-10.

A diagnostic test was administered to Grades 7-10 students to assess their number sense across three key categories: Numbers, Operations and Computational Estimation, and Data Sense Making.



Figure 3. Salvacion HS junior high school students taking the diagnostic test



Figure 8. Orientation meeting with Salvacion HS teachers.

Capacity Building of Teachers

This project started with the enhancement of teachers' capacity in instructional material development and the conduct of action research as essential inputs to the implementation of the extension program. To achieve this objective, two seminar-workshops were conducted, with participants including graduate students engaged in curriculum development, teachers from the extension site, and other interested educators.

The first was a two-day seminar-workshop designed to strengthen three key areas of professional growth: instructional material development using representation-based approaches, the conduct of action research, and an understanding of design-based research. The seminar was carefully structured to enable participants to develop effective curriculum materials while simultaneously engaging in action research to improve instructional practice. Design-based research was introduced to equip participants—particularly the graduate students—with the research skills necessary for the continuous refinement of the developed materials for wide-scale distribution.



Figure 9. Seminar-workshop publication material and attendees

The seminar provided a space for participants to collaborate, share ideas, and create instructional tools they can apply in their own classrooms, and possible action research while implementing the innovations. The seminar workshop was attended by 72 teachers who highly rated the various aspects of the seminar with an overall rating of 4.71 (excellent). It also contributed to professional growth of teachers, including those from the beneficiary school with the PRC approved 8 CPD points for the seminar.



Figure 10. Seminar participants presenting their developed LM and collaborating for possible action research

The second workshop seminar was conducted as result of some challenges in the initial implementation of the LMs developed. Some students have difficulty reading texts and understanding activity instructions. There also seemed to be other preferences for learning. This seminar explored alternative pathways to numeracy and literacy. Still grounded in the principles of the representation-based approach, it emphasized how zines—small, self-published booklets—can serve as powerful tools to enhance both numeracy and literacy development. Training participants explored how to design and integrate zines into their teaching practices through hands-on activities such as creating sample zines, collaborating with peers, and developing classroom applications that align with curriculum goals. The one-day seminar workshop was awarded 4 CPD points by PRC.



Figure 11. Seminar publication material and certificate awarded

By the end of the one-workshop, teacher participants were equipped with both theoretical grounding and practical tools to implement zine-making as a pedagogical strategy that bridges literacy and numeracy learning in innovative and meaningful ways. The seminar workshop ended with presentation and critiquing of the zines developed by the participants.

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Figure 12. Sample of zines produced by seminar participants

The seminar workshop was attended by 102 teachers, who rated the event very highly, giving it an overall score of 4.88 (excellent), reflecting strong satisfaction with the content, organization, and practical applicability of the activities. The comments extracted from the Overall Training Evaluation Sheets has three themes:

1. **Positive and Enriching Training Experience.** Participants described the training as enriching, insightful, and valuable, indicating that the session provided meaningful learning experiences. Many reported gaining new knowledge and insights. The creativity introduced with zines generated interest among participants in adopting creative approaches as instructional tools.

2. **Contribution to Professional Practice.** Participants acknowledged that the seminar enhanced their knowledge and skills, enabling them to improve and adapt their professional practice. They noted that the session provided practical ideas and tools to support their teaching, particularly in numeracy and literacy instruction.

3: **Desire for Continuous Professional Development.** Participants expressed strong interest in attending additional seminars and training programs, particularly those focused on strengthening pedagogy and instructional skills. They also suggested incorporating digital or software-based demonstrations, such as Canva and other applications, to better support teachers who prefer computer-based activities over handmade outputs.



Figure 13. Participants of the seminar-workshop with MST and PhD Ed Math Students

Design, Development, Validation, and Development of LMs

The extension project initially intended to involve the mathematics teacher at the beneficiary school; however, this did not materialize due to the absence of a designated mathematics teacher. The design and development of the instructional materials were therefore undertaken collaboratively by PhD and MST students, together with faculty members from the Department of Mathematics and Statistics serving as subject matter experts.

The development was anchored on the positive outcomes of a previous research initiative

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(Tandog & Verzosa, 2021), as well as on the initially developed LMs and the Professional Learning Community (PLC) structure for lesson study and pedagogical sharing established during the previous extension project (Tandog et al., 2022). The LMs prioritized the development of mathematical thinking and skills, with curriculum content serving primarily as a vehicle for cultivating the identified competencies. This approach seeks to address gaps in basic education, where instruction often tends to emphasize content coverage over the development of mathematical thinking and conceptual understanding.

The developed materials emerged from research lesson study conducted by the assigned groups and were guided by representation-based frameworks deemed appropriate by each group, including the Multiple Representation Approach (MRA), Concrete–Representational–Abstract (CRA), Representation Construction Approach (RCA), Concept Attainment (CA), and other related approaches, as shown in the following table.

Table 1. Mathematical thinking skills and content coverage of developed LMs.

Mathematical Thinking Skill	Content	Topics	Framework	Validation
Number Sense and Estimation	Numbers and Number Sense	-Number	- McKintosh/MRA	Complete
		-Operations (Multiplication)	-Array Models	(on-going)
		-Fractions	-RCA	Complete
Proportional Reasoning		-Percents	-Proportional Thinking	Complete
Relational Thinking	Sets	-Sets and Set Operations	-RCA -CA	Complete
Data Sense Making/ Quanti-tative Reasoning	-Descriptive Statistics	-Data Presentation -Average & spread	Microlearning	Complete
Predicting/Induct ive Reasoning	Patterns and Sequences	-Number Sequence	Inductive Learning Model	Complete
		-Arithmetic/ Geometric Seq		(On-going)
Spatial Reasoning	Geometry	-Polygons	-CA -Van Heile -CRA	Complete
		-Areas and Perimeter		(On-going)
Logical Reasoning	Mathematical Logic	- Conditional Statements	-CRA -Van Heile	Complete
Probabilistic Thinking	Combinatorics	-Counting Techniques	-CRA	Complete
		-Combination -Permutation	-CA -CRA	(On-going)
	Probability	-Simple Probability		(On-going)
Symbolic Thinking	Algebra	-Alg. Expressions		(On-going)
Problem Solving		-Linear Equation		(On-going)
Measuring	Measurement		-	(On-going)

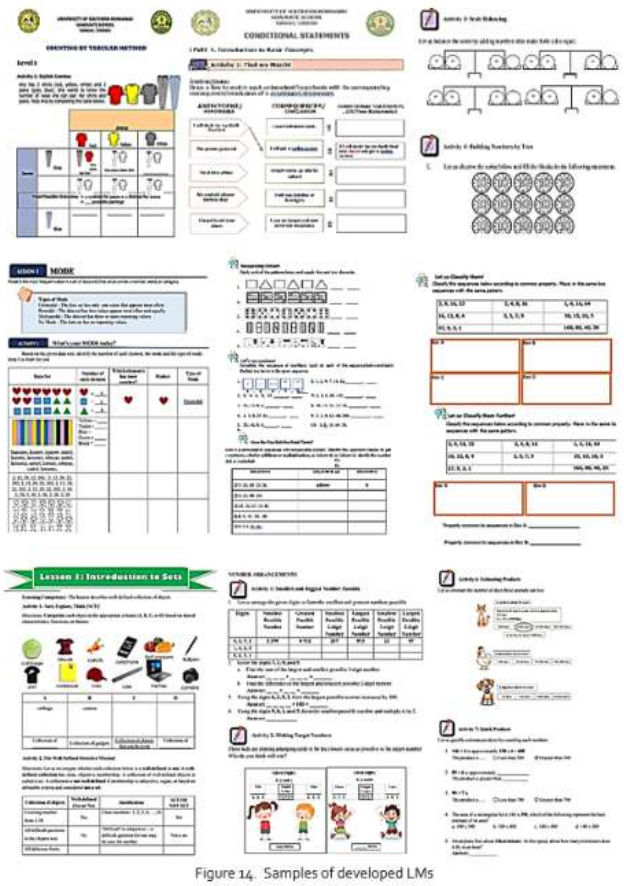


Figure 14. Samples of developed LMs

The initial review of the developed materials was conducted online, with PhD Mathematics Education students serving not only as reviewers but also as critics who provided suggestions for improvement. The validation process was conducted primarily face-to-face with faculty members from the Department of Mathematics and Statistics, who served as subject matter experts.

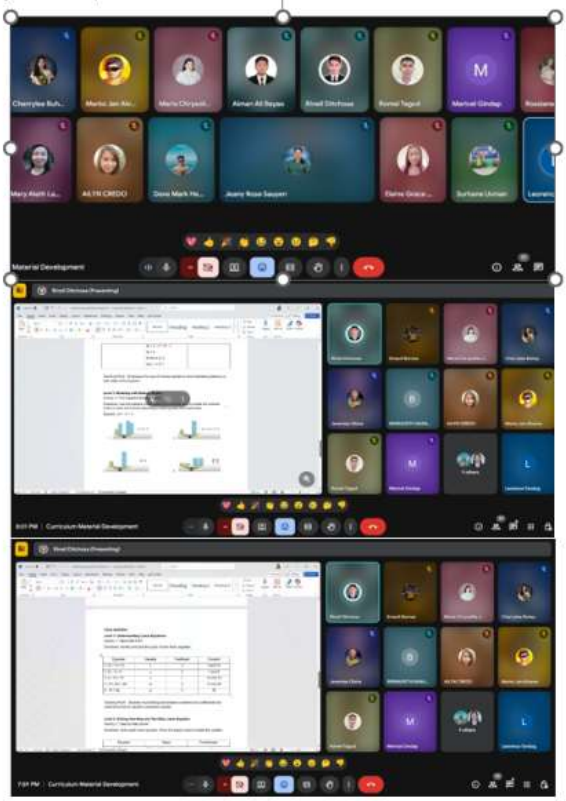


Figure 15. Online meetings and presentations of developed LMs

The pilot testing of the developed LMs varied across groups. Some groups conducted pilot tests with students in their respective schools. Others selected a small number of students who shared similar characteristics with the target users to implement the materials and determine whether, after using them, the students were able to answer the intended pretest items. Revisions were made based on the results of these pilot tests.

For several groups, the initial implementation of the validated materials in the beneficiary school functioned as pilot testing, with revisions undertaken topic by topic. Adjustments were made including in the pacing of instruction and the number of activities assigned, based on how students interacted with the materials in the preceding lessons.

Implementation of LMs

After the preliminary arrangements and school visits, implementation commenced in mid-September 2026, with MST and PhD students taking the lead in deploying the (LMs) they had developed, under the guidance of faculty members from the Department of Mathematics and Statistics. The extension project team was allocated every Friday by the partner school for the implementation of the LMs.



PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION



Figure 15. PhD Ed and MST math students during deployment and implementation of LMs

At the start of deployment, several student difficulties in using the materials were observed.

- Numbered instructions were interpreted as test items to be answered.
- Lettered examples were perceived as multiple-choice options to be encircled.
- Black-and-white printing rendered color-highlighted important texts unnoticeable.

These observations indicated underlying issues in reading comprehension and test-taking habits. The LM writers suggested color printing to make important texts more noticeable. Adjustments in numbering and formatting were also considered. However, upon reflection, the original numbering and example formats were retained to address students' tendency to treat lettered items as multiple-choice options and to encircle answers mechanically without fully comprehending the instructions or content. Table 2 shows the schedule of implementation of different LMs.

Table 2. Schedule of LM deployment and implementation

Mathematical Thinking Skill	Content	Topics	Dates Implemented	Grade Level
Number Sense and Estimation	Numbers and Number Sense	-Number	September, October	Grades 7-12
		-Operations (Multiplication)	For Implementation	
		-Fractions	For Implementation	
Proportional Reasoning		-Percents	For Implementation	
Relational Thinking	Sets	-Sets and Set Operations	October, November	Grade 8,10
Data Sense Making/ Quantita-tive Reasoning	-Descriptive Statistics	-Data Presentation -Average & spread	October, November	Grade 9
Predicting/Inductive Reasoning	Patterns and Sequences	-Number Sequence	October, November	Grades 11-12
		-Arithmetic/ Geometric Seq	For Implementation	
Spatial Reasoning	Geometry	-Polygons	For Implementation	
		-Areas and Perimeter		
Logical Reasoning	Mathematical Logic	- Conditional Statements	For Implementation	
Probabilistic Thinking	Combinatorics	-Counting Techniques	For Implementation	
		-Combination -Permutation	For Implementation	
	Probability	-Simple Probability	For Implementation	
Symbolic Thinking	Algebra	-Alg. Expressions	For Implementation	
Problem Solving		-Linear Equation	For Implementation	
Measuring	Measurement		For Implementation	

Of the 11 targeted mathematical thinking skills, only four were fully implemented. The start of implementation was delayed by one month due to the extended validation and revision of the LMs and pretests, which took longer than anticipated. Additional factors also contributed to the partial implementation of the developed LMs, including class suspension due to school district's scheduled activities, cancellation of classes following an earthquake, and shortened class periods due to armed conflict in a neighboring area.



Figure 16. Extensionists Ensuring Student Safety During the October 10 Earthquake

The deployment of the learning materials was halted in November due to a land conflict in a nearby barangay and a killing incident on December 2, 2025, along the road leading to Salvacion. This decision was made to ensure that the safety of the graduate students and faculty members actively participating in the extension program was not compromised. As such many of the developed materials are still for implementation as shown in Table 2.



Figure 17. Newsclips of incidents that affected project implementation

Aside from the deployment of learning materials (LMs), a review in preparation for college admission examinations was conducted for senior high school students. The Department of Mathematics and Statistics provided review sessions on mathematics and quantitative reasoning, aiming to improve students' problem-solving skills and test-taking strategies. Other test components, such as English and Science, were delegated to the school as it has available teachers to handle these subjects. This collaborative effort provided a comprehensive review experience and helped enhance students' readiness and confidence for college admission examinations.



Figure 17. USM conducting a review for college admission tests

The school also requested assistance from the Mathematics and Statistics faculty extensionists in training selected students for the Damath competitions, further strengthening the collaboration between the university and the partner school while providing students with opportunities to develop their mathematical and strategic skills. This support helped enhance students' computational skills, and strategic decision-making, which are essential in mathematical problem-solving and competitive events.



Figure 17. USM coaching student contestants for DAMATH competition

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

Outcomes of the Project

The targeted major outcome of this project is the enhancement of numerical literacy and mathematics performance and among barangay high school students through the implementation of the developed LMs

1. **Improved** overall performance of the target school and increase the chances of its senior high school (SHS) students being admitted to the University of Southern Mindanao (USM).
   - Improved numeracy

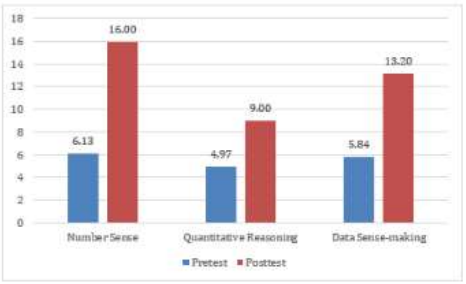


Figure 18. Pretest and Posttest performance of students

2. **Improved** ranking in mathematics competitions





3. Enhanced potential for college admission

Data	SY 2024-25		SY 2025-26	
	f	%	f	%
Grade 12 Grad	23		19	
Took the Exam	5	21.7	6	31.6
Passed USM CEE	2	40	6	100.0
Admitted to BS Program	2			
Admitted to Associate Program	1			

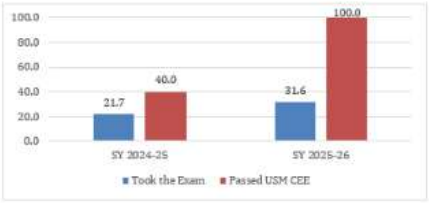


Figure 19. Comparative performance of Senior HS students in USMCEE

Extension Project Outputs

This project has produced the following outputs:

1. Developed and validated learning materials on at least ten topics
2. Three completed action research
3. One research article ready for journal publication submission



Figure 20. Research article from extension project for journal publication

REFERENCES

De las Peñas M.L. A., & Bautista, D.M (2008). Understanding and developing proofs with the aid of technology. *Electronic Journal of Mathematics and Technology*, 2(3), 262-273.

Gutierrez, J., & Bilefsky, D. (2021). With schools closed, Covid-19 deepens a Philippine education crisis. Retrieved October 19, 2021, from https://www.nytimes.com/2021/09/13/world/asia/philippines-students-remote-covid.html

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Orata, P. (1979). Barangay High Schools for Countryside Development. *International Review of Education*, 25(4), 545-550.

Taka D., Taka A., & Budinski N. 2010. On visualization problems using the GeoGebra and Scientific Workplace packages. *International Journal for Technology in Mathematics Education* 17(4)

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

10. Evaluation

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

POST TRAINING EVALUATION

Training Title: Empowering Educators: Crafting Learning Materials and Implementing Design-Based Research
Sponsoring Agency: USM Graduate School and College of Science and Mathematics
Resource Person/s: Ms. Aurea Puyos, Dr. Ian June Garces, Dr. Debbie Marie Verzosa, Dr. Leorence Tandog, and Assoc. Prof. Anna Jean Garcia
Inclusive Date/s: May 30 – 31, 2025
Venue: Graduate School Hall, University of Southern Mindanao, Kabacan, Cotabato

Instructions
A. Please evaluate the training/activity by ticking the appropriate column.

		Very Satisfactory	Satisfactory	Fair	Poor
1	The objectives of the training were clearly defined.	✓			
2	Participation and interaction of the participants was encouraged.	✓			
3	The topics covered were relevant to the participants.	✓			
4	The content of the training was organized and easy to follow.	✓			
5	The materials distributed were helpful.		✓		
6	The training experience is useful to the participants' work.	✓			
7	The trainer was knowledgeable about the training topics.	✓			
8	The trainer was well prepared.	✓			
9	The training objectives were met.	✓			
10	The time allotted for the training was sufficient.		✓		
11	The venue and facilities were conducive for the activity.		✓		
12	Food was sufficient and filling.		✓		
13	The sponsors were approachable and readily available when needed.	✓			
14	Sessions were conducted on time.		✓		
15	Adequate time was allotted for the presentation and discussion of the topics.		✓		

B. Please write your answer on the space provided.

1. What did you like most about this training?
The topics are very useful and informative
2. What specific practice/s in your present work would you hope to change as a result of the training?
My way of writing math questions/problems
3. What aspects of the training could be improved?
Venue, food
4. What other trainings would you like to undergo in the future?
AI in Math Education.
5. What other comments would you like to add?
Very Good!

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

RESOURCE PERSON EVALUATION SHEET

Topic/s Discussed (to be filled out by the training facilitator/s)	Lecture 4: Design-Based Research
Resource Person (to be filled out by the training facilitator/s)	Assoc. Prof. Anna Jean Garcia

Based on the scale below, please rate the Resource Person Based on the following statements

1	Poor	4	Very Satisfactory
2	Fair	5	Excellent
3	Satisfactory		

Particulars	☹ 1	☹ 2	😐 3	☺ 4	☺ 5
The resource person displayed a thorough knowledge of the topic and was able to provide insights					✓
The resource person explained and processed the activities thoroughly					✓
The resource person sustained the attention of participants and encouraged their participation					✓
The resource person was able to create a good learning climate					✓
The resource person was able to manage their time well					✓
The resource person was sensitive to the participants' needs					✓
Comments: I was amazed by the study. It shows higher order research skills.					

Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

OVERALL TRAINING/ ACTIVITY EVALUATION SHEET

Training Details
Title of Training:
Date: _____ Venue: _____

Instructions: Please make an honest assessment of the activity by ticking on the best represents your response.

Item / Particulars	☹ 1	☹ 2	😐 3	☺ 4	☺ 5
Course Content and Structure					
• The objective of the activity was clearly stated at the beginning of the session					✓
• The sequence of the topics was easy to follow					✓
• There was sufficient time allocated for each topic					✓
• The content of the session was clear and easy to understand					✓
Training Activities					
• There were sufficient activities in the session					✓
• The activities increased my knowledge and understanding					✓
• The group activities encouraged my participation					✓
Methodology and Materials					
• The instructional materials and presentation aids used helped me understand the topics better					✓
• The delivery method (e.g. lecture, training, FGD, forum was suitable for the activity)					✓
• The delivery method assisted my learning and understanding					✓
Training Management Team, Facilities and Services					
• The activity was well-organized and facilitated					✓
• The secretariat was approachable and helpful					✓
• The venue was conducive for the activity					✓
Suggested activity/ training course in the future: Statistical tools and its application in educational research					

Name of Participant (Optional) _____

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

Overall Training/Activity Evaluation

Training Detail

Name of Training: **Empowering Educators: Crafting Learning Materials and Design Implementing Design-Based Action Research**

Venue: **USM Graduate School**

Date: **May 30-31, 2025**

Particulars	Weighted Mean	Verbal Description
Course Content and Structure		
The objective of the activity was clearly stated at the beginning of the session	4.96	Excellent
The sequence of the topics was easy to follow	4.84	Excellent
There was sufficient time allocated for each topic	4.52	Excellent
The content of the session was clear and easy to understand	4.88	Excellent
Training Activities		
There was sufficient activities in the session	4.93	Excellent
The activities increased my knowledge and understanding	4.95	Excellent
The group activities encouraged my participation	4.81	Excellent
Methodology and Materials		
The instructional materials and presentation aids used helped me understand the topic better	4.62	Excellent
The delivery method (e.g. lecture training, FGD, forum) was suitable for the activity	4.72	Excellent
The delivery method assisted my learning and understanding	4.55	Excellent
Training Management Team, Facilities and Services		
The activity was well-organized and facilitated	4.43	Very Satisfactory
The secretariat was approachable and helpful	4.45	Very Satisfactory
The venue was conducive for the activity	4.51	Excellent

Rating Scale: 4.50-5.00 Excellent, 3.50-4.49 Very Satisfactory, 2.50-3.49 Satisfactory, 1.50-2.49 Fair, 1.00-1.49 Poor

SUMMARY OF RESOURCE PERSON/S' EVALUATION		Resource Person 1		Resource Person 2		Resource Person 3	
Item Code	Particulars	Weighted Mean	Verbal Description	Weighted Mean	Verbal Description	Weighted Mean	Verbal Description
1	The resource person displayed a thorough knowledge of the topic and was able to provide insights	4.76	Excellent	4.86	Excellent	5.00	Excellent
2	The resource person explained and processed the activities thoroughly	4.65	Excellent	4.79	Excellent	4.93	Excellent
3	The resource person sustained the attention of participants and encouraged their participation	4.43	VS	4.86	Excellent	5.00	Excellent
4	The resource person was able to create a good learning climate	4.62	Excellent	4.79	Excellent	4.97	Excellent
5	The resource person was able to manage their time well	4.73	Excellent	4.55	Excellent	4.93	Excellent
6	The resource person was sensitive to the participants' need	4.68	Excellent	4.83	Excellent	4.97	Excellent
	Total Mean Rating	4.65	Excellent	4.78	Excellent	4.97	Excellent

TO WHOM IT MAY CONCERN:

THIS IS TO CERTIFY that the extension project titled **"Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools (AY 2025-2026)"**, implemented by the University of Southern Mindanao at Salvacion High School, Matalam, Cotabato, has fully met and satisfied all the prescribed guidelines, standards, and requirements set forth under **JC3 CMO No. 18, Series of 2025.**

THIS IS FURTHER TO CERTIFY that, having successfully fulfilled the prerequisite monitoring and implementation compliance metrics under the aforementioned Joint Circular/CMO guidelines, the project was deemed **ELIGIBLE** for the conduct of the official Client Satisfaction Survey (CSS).

THIS LIKEWISE CERTIFIES that the **Terminal Report** for the project was officially completed, submitted, and duly received on time by the **Extension Services Office** in accordance with institutional schedules and project reporting timelines.

The project obtained a total of **87.2 points out of the maximum score of 100 points,** based on the results of the official Client Satisfaction Survey (CSS) conducted among the target beneficiaries.

Attached herewith is the official summary of the CSS Results conducted among the target beneficiaries.

GLYN B. GABANO-MAGBANUA

Director, Extension Services Office

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MARGIE N. [illegible]TUAN-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date:_____

O.2. The Extension Program has contributed to the improvement on the quality of life of the target clientele/ beneficiaries.

Outcomes of the Project

The targeted major outcome of this project is the enhancement of numerical literacy and mathematics performance and among barangay high school students through the implementation of the developed LMs

1. **Improved** overall performance of the target school and increase the chances of its senior high school (SHS) students being admitted to the University of Southern Mindanao (USM).
    - Improved numeracy

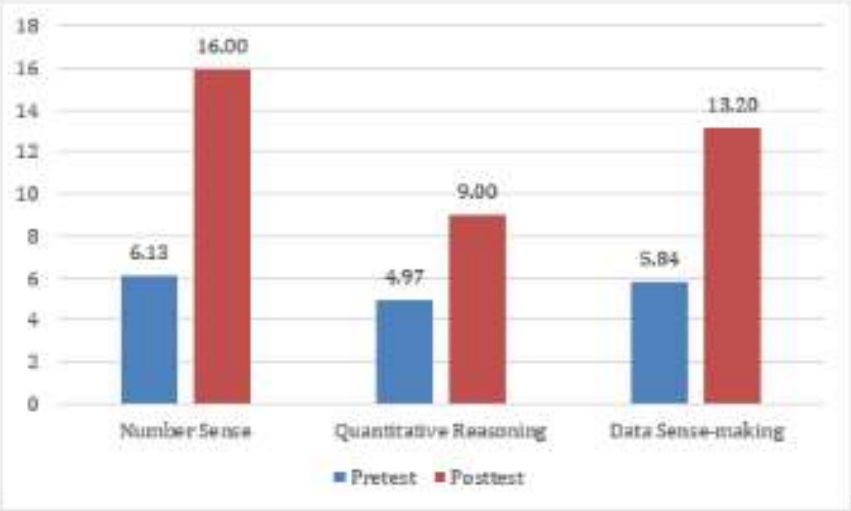


Figure 18. Pretest and Posttest performance of students

2. **Improved** ranking in mathematics competitions





3. Enhanced potential for college admission

Data	SY 2024-25		SY 2025-26	
	f	%	f	%
Grade 12 Grad	23		19	
Took the Exam	5	21.7	6	31.6
Passed USM CEE	2	40	6	100.0
Admitted to BS Program	2			
Admitted to Associate Program	1			



Figure 19. Comparative performance of Senior HS students in USMCEE

PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

DepEd RXII Salvacion HS
October 10, 2025 ·

Empowering Education Through Research: Dr. Leorence C. Tandog Leads USM Master of Mathematics Students in Conducting Action Research at Salvacion High School

It was indeed a great privilege for Salvacion High School to be chosen as the research site by the Vice President for Academic Affairs of the University of Southern Mindanao (USM), Dr. Leorence Tandog, together with her students majoring in Mathematics.

The purpose of the activity was to conduct an Action Research that aims to address relevant issues and challenges in the field of Mathematics education.

Salvacion High School expressed its heartfelt gratitude to Dr. Tandog and her students for selecting the school as the recipient of the research outputs that will be produced from their study.

The findings and materials developed through this research are expected to benefit both teachers and learners, enhancing instructional strategies and strengthening the quality of Mathematics education within the school.

This partnership embodies the spirit of academic collaboration, community engagement, and continuous professional growth—values shared by both the University of Southern Mindanao and Salvacion High School. Truly, this endeavor serves as a step forward in promoting excellence in education and fostering a culture of research-based improvement in teaching practices.🙌👍✓

See less





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PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION

DepEd RXII Salvacion HS
October 18, 2025 ·

MATHLETES ON THE MOVE:: Salvacion High Competes in Municipal Level Math Olympics!

Salvacion High School proudly congratulates its students for representing the Matalam Central District in the Municipal Level Mathematics Olympics held on October 18, 2025, at New Alimodian High School.

The event featured participants from Grades 8, 9, and 10 in DAMATH, as well as Junior and Senior High School students in Sudoku.

Guided by their dedicated coaches, Mr. Norman Jhorie Estillore and Ms. Honey Farinas, the team showcased exceptional skill, teamwork, and mathematical excellence.

This achievement was made possible through the full support of Ms. Romelyn D. Nicolas, School Head (HT III), and Dr. Roselita Baldestamon, School District Supervisor.

Congratulations to our Mathletes for bringing pride and honor to Salvacion High School and the Matalam Central District! 🏅✨ **See less**





PARAMETER B: PLANNING IMPLEMENTATION, MONITORING AND EVALUATION



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CLIENT SATISFACTION SURVEY REPORT

Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools

Project Leader:

Leorence C. Tandog

Component Leaders:

PHILIP LESTER P. BENJAMIN
LEONARD M. PALETA
JUPITER G. PILONGO
DEBBIE MARIE B. VERZOSA

Fund Source:
FUND 01

Period of Implementation:
2025

Community Beneficiaries:
Salvacion Highschool, Matalam, Cotabato

Participants:

Anna Jean S. Garcia
Rowel P. Madio,
Daryl Mae C. Mamon
Sandra A. Nanding
Roel S. Valenton
Lawton John A. Yabes
Dominic C. Carajay
Lidey Sultan
Aurea Puyos
Ian June Garces
Jeaneth R. Licaros
Jead M. Macalisang
Mauricio Jr. J. Magallon
Hannah Jane Faith Palmos
Jennifer Pama
Fitzmee Ann D. Tamulak
Arnel B. Toledo
Maria Luz D. Calibayan
Shandra C. Gonsang

the importance of providing continuous technical assistance, strengthening orientation activities, and refining the instructional materials based on users' experiences and feedback to ensure their effective utilization in future implementations.

Table 2. Mean Satisfaction Ratings of Beneficiaries on the "Strengthening Barangay Highschool" Project (n = 50)

Indicator	Weighted Mean	Interpretation
A.1 Addressed Community Needs	4.36	Strongly Agree
A.2 Knowledge & Skills	4.40	Strongly Agree
A.3 Implementation of Objectives	4.46	Strongly Agree
A.4 Followed Schedule	4.29	Strongly Agree
A.5 Clarity of Activities	4.34	Strongly Agree
A.6 Listened to Suggestions	4.46	Strongly Agree
A.7 Improved Lives	4.46	Strongly Agree
A.8 No Negative Effects	3.80	Agree
A.9 Overall Satisfaction	4.52	Very High Satisfaction
A.10 Recommend to Others	4.50	Very Likely
OVERALL GRAND MEAN	**4.36**	**Excellent**

The findings indicate that extension project was successfully implemented and positively received by its beneficiaries. The consistently high ratings across the survey indicators, together with an overall grand mean of 4.36, demonstrate that the project effectively provided relevant instructional resources, strengthened teacher capacity, and supported mathematics learning through the implementation of representation-based Learning Activity Pages (LAPs). The comparatively lower rating for the absence of negative effects underscores the need to continuously refine the instructional materials, sustain technical support, and strengthen follow-up activities to ensure that future implementations remain responsive to the needs of teachers and students while further enhancing the quality and sustainability of mathematics instruction in remote barangay high schools.

Beneficiaries' Feedback and Recommendations

The qualitative feedback provided by the beneficiaries complements the findings of the Client Satisfaction Survey by offering deeper insights into their experiences during the implementation of the Strengthening Barangay High Schools extension project. Overall, the responses reflected favorable perceptions of the project, with both students and teachers expressing appreciation for the learning activities, instructional approaches, and representation-based learning materials introduced during the implementation. At the same time, the beneficiaries identified several recommendations that may further enhance future implementations of the project and similar extension initiatives.

One of the most prominent themes that emerged from the responses was the beneficiaries' appreciation of the teaching approaches employed by the project team. Many students described the learning sessions as understandable, engaging, and enjoyable, noting that the explanations and demonstrations helped them better follow the mathematics lessons. Several respondents also expressed that they appreciated

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MARGIE N. [illegible]UTUAN-GALANG
Chief Administrative Officer

the patience and commitment demonstrated by the project implementers throughout the conduct of the activities.

"Nagustuhan ko ang kanilang pagtuturo sa amin dahil malintindihan mo ang kanilang pagtuturo talaga." —P6

Similarly, another participant shared:

"Nagustuhan namin ang turo ng USM kasi mas madali na naming maintindihan ngayon kaysa sa dati." —P26

These responses indicate that the beneficiaries viewed the instructional strategies and representation-based Learning Activity Pages (LAPs) positively and appreciated the learning opportunities provided through the extension project.

Another recurring theme was the beneficiaries' strong interest in the continuation of the project. Numerous respondents expressed their hope that the University of Southern Mindanao would revisit the school and continue conducting mathematics learning sessions. Several participants believed that additional learning opportunities would allow them to further develop their understanding of mathematics and gain greater confidence in solving mathematical problems.

"Sana bumalik pa sila para matuto pa ang mga estudyante." —P18

Likewise, one respondent remarked:

"Gusto ko is babalik pa sila dito sa susunod na araw o buwan at magturo ulit kasi para makatuto ng maayos." —P16

These comments suggest that the beneficiaries appreciated the project's implementation and expressed a desire for sustained learning support beyond the initial implementation period.

The responses likewise revealed the beneficiaries' interest in broadening the mathematics topics covered by future activities. Several students recommended including additional lessons on Algebra, mathematical problem solving, advanced mathematics, and other concepts that they considered difficult. Others suggested providing more opportunities for guided practice, review sessions, and problem-solving activities to help them better understand mathematical concepts.

"Sana maturo sa amin ang mga Algebraic Expression at mga multinomials." —P21

Similarly, another respondent suggested:

"Ang gusto namin ay lagi kaming turuan sa iba't ibang problem sa math para sa susunod malaman na namin." —P9

These recommendations indicate that the beneficiaries recognized the value of the learning sessions and expressed interest in expanding similar activities to cover a wider range of mathematics competencies in future implementations.

Several beneficiaries also recommended extending similar extension initiatives to other learners and schools facing comparable educational challenges. Respondents

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MARGIE N. B[illegible]UAN-GALANG
Chief Administrative Officer

expressed appreciation that their school was selected as the project's partner institution while encouraging the University to provide similar opportunities to other communities.

"Sana marami pa ang inyong matulungan at maturuan na pearalan."—P27

Likewise, another beneficiary recommended:

"Ipagpatuloy ang proyekto at mas marami pang paaralan ang makinabang."—P50

These responses reflect the beneficiaries' positive perception of the project and their belief that similar extension initiatives may also be beneficial to other barangay high schools experiencing similar instructional challenges.

Teacher respondents likewise emphasized the importance of sustaining implementation support after the project's completion. One teacher noted that the learning materials provided additional instructional resources that could support classroom teaching while also helping teachers better understand learners' mathematical difficulties.

"The project help us mathematics teacher to teach students in more engaging way... The project also help teachers analyze the problem of students in terms of mathematical [difficulties] and teach us how to deal with it effectively." —P46

Other teacher respondents recommended the continued provision of learning materials and periodic monitoring to support the implementation of the developed instructional resources within the school.

"Continue supervision and giving learning materials to the students." —P48

These recommendations underscore the importance of providing continuing technical support and monitoring to facilitate the sustained utilization and refinement of the developed Learning Activity Pages (LAPs) in future implementations.

The qualitative feedback complements the findings of the Client Satisfaction Survey by demonstrating that the beneficiaries generally viewed the extension project positively and appreciated the learning opportunities it provided. The respondents consistently expressed satisfaction with the instructional approaches employed during the implementation while recommending the continuation of mathematics learning sessions, expansion of lesson coverage, sustained implementation support, and wider adoption of similar initiatives in other schools. Although the majority of the feedback was favorable, a small number of beneficiaries noted that some mathematical examples and explanations were occasionally difficult to follow or required further clarification. These comments suggest the importance of continuously refining the instructional strategies and learning materials to accommodate the varying levels of mathematical preparedness among learners. Future implementations may also consider providing additional guided practice, contextualized examples, and reinforcement activities to further enhance learners' understanding and engagement. Collectively, these insights provide valuable guidance for project implementers in refining succeeding phases of the initiative and strengthening the delivery of extension