AREA VI – EXTENSION AND COMMUNITY INVOLVEMENT

Parameter A – PRIORITIES and RELEVANCE

1. SYSTEM-INPUTS AND PROCESSES

- Present the Institution's approved Extension Agenda

1.3 RDE Agenda (BOR Resolution No. 69, series 2021)

In support to the national agenda and in consultations with stakeholders, the RDE themes are as follows:

RDE Themes	RDE Priority Areas
Quality Learning, Skills Development, and Literacy	Innovative teaching strategies; development and evaluation of functional education materials and modalities, and teaching strategies/approaches, motivation, and engagement; school climate; school and knowledge management; special education; remedial education; curriculum development and implementation; alternative learning system; assessment studies; soft skills; practical skills; adult education; language literacy; numerical literacy; data literacy; computer literacy; international studies; tracer studies; livelihood programs;; capacity building; capability building
Social Development, and Strong Institutions	Gender and development GAD; peace initiatives; community development; human security; justice; public policy and legislations; social rehabilitation; governance; organizational studies; behavioral studies; social institutions; ethics and public accountability; programs/project assessment; community needs assessment and interventions; partnerships and linkages; technology adoption; Institutional development; upgrading of laboratory and lecture facilities
Preservation of Culture	Multicultural studies; educational materials for IPs; indigenous knowledge systems and practices; development of materials for cultural knowledge and promotion; arts; language and literature studies; traditional dance, sports and music; halal studies
Environmental Protection, Conservation, and Risk Reduction	Environment rehabilitation studies; biodiversity; climate change adaptation; risk, hazard and mitigation; biosafety; natural resources conservation and management; bioremediation; flood control; waste management; ecological preservation and care; environmental impact assessment; tourism; agroecology; natural farming
Food Security and Poverty Reduction	Agricultural and fisheries research; biotechnology; innovations; quality food product development; technology development; halal food production; sustainable production; responsible consumption; organic agriculture; food testing; smart agriculture; precision farming; farm machineries; post-harvest facilities; vertical farming; indigenous food; food tourism; development of new breeds and varieties

RDE Themes	RDE Priority Areas
Good Health and Wellbeing	Nutrition; nutraceuticals; sports, physical education; physical fitness; sports psychology; health resiliency; psycho-social health; medical and medicinal studies; hygiene and sanitation; functional foods; food and water quality and safety; mental and emotional health; therapy; coping mechanism; preventive measures; emerging diseases; health management; traditional and alternative medicine; community health; risk assessment and mitigation; health informatics, regenerative medicine, emergency response medicine
Innovations in Science, Engineering, and Technology	Innovations and futures thinking; product and technology development; energy; materials science; nanotechnologies; robotics; artificial intelligence; internet of things; Science, Engineering, Communication, and Technologies (SECT) 4.0; biotechnology and OMIC technologies; inventions and discoveries; basic research; information technologies; electronics; drug discovery; mathematics; emerging technologies; fabrication; transport system; waste management; infrastructure; water systems; simulation studies; industrial and allied technology, Data Science and Analytics, GIS, Remote sensing, machine learning; quantum technology; smart cities
Sustainable Entrepreneurship and Management	Economics; micro and macro scale business; product development; marketing; commercialization; networking; franchising; financial management; business feasibility studies; risk and opportunities; value adding; value chain analysis; organizational management; quality service assessment; human resource management; production management; sustainable cooperative studies; Entrepreneurial studies

Extracted from USM RDE Manual 2024:
https://drive.google.com/file/d/1p4l5JncGSNNHwTQHNXf-6OV4uQr24JIo/view?usp=sharing

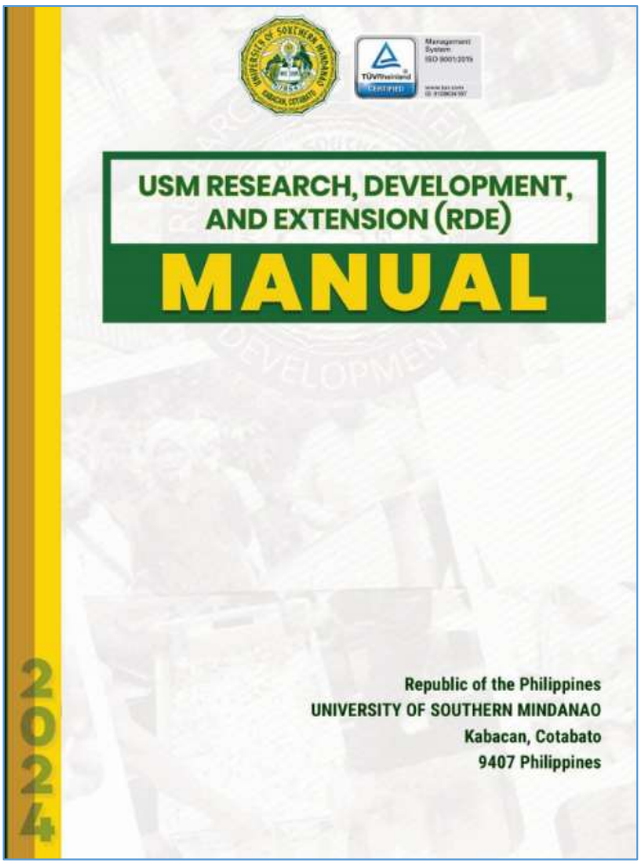
University of Southern Mindanao

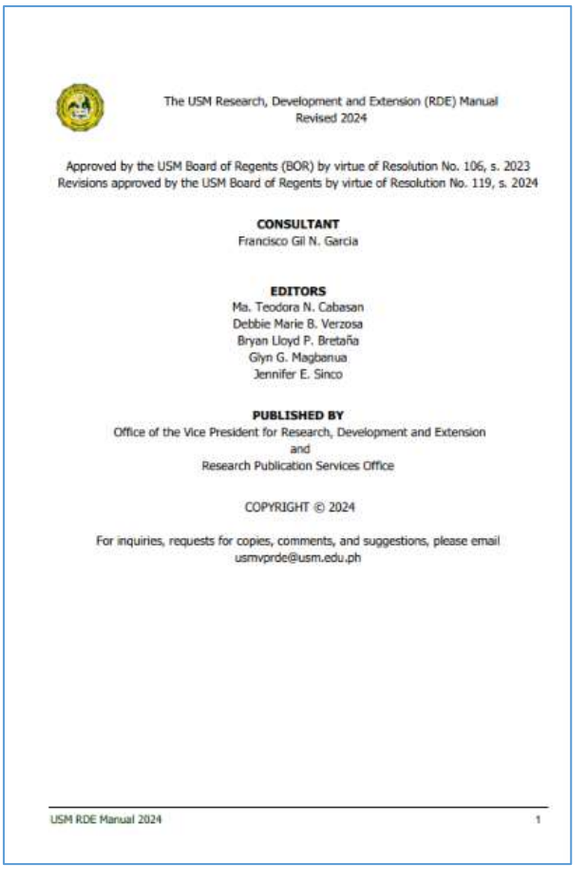
Research, Development and Extension (RDE) Agenda (2022-2031)

	RDE Themes	RDE Priority Areas
1	Quality Learning, Skills Development, and Literacy	Innovative teaching strategies; development and evaluation of functional education materials and modality; development of strategies/approaches for increased learning interest, motivation and engagement; school management; knowledge management; special education; remedial education; alternative learning system; assessment; soft skills; practical skills; adult education; language literacy; numerical literacy; data literacy; computer literacy; international studies; tracer studies
2	Social Development, and Strong Institutions	Gender and development (GAD); peace initiatives; community development; human security; justice; public policy and legislations; social rehabilitation; governance; organizational studies; behavioral studies; social institutions; ethics and public accountability; programs/project assessment; community needs assessment and interventions; partnerships and linkages
3	Preservation of Culture	Multicultural studies; educational materials for IPs; indigenous knowledge systems and practices; development of materials for cultural knowledge and promotion; arts; language and literature studies
4	Environmental Protection, Conservation, and Risk Reduction	Environment rehabilitation studies; biodiversity; climate change adaptation; risk, hazard and mitigation; biosafety; natural resources conservation and management; bioremediation; flood control; waste management; ecological preservation and care; environmental impact assessment
5	Food Security and Poverty Reduction	Agricultural and fisheries research; biotechnology; innovations; quality food product development; technology development; halal food production; sustainable production; responsible consumption; organic agriculture; food testing; smart agriculture; precision farming; livelihood programs; subsidy impact assessment; capacity building; capability building; farm machineries; post-harvest facilities; vertical farming; indigenous food
6	Good Health and Well-being	Nutrition; sports; physical education; resilience; psycho-social health; medical and medicinal studies; sanitation; functional foods; food and water quality and safety; mental and emotional health; therapy; coping mechanism; preventive measures; emerging diseases; health management; alternative medicine
7	Innovations in Science, Engineering, and Technology	Innovations; product and technology development; energy; materials science; nanotechnologies; robotics; artificial intelligence; internet of things; Science, Engineering, Communication, and Technologies (SECT) 4.0; biotechnology and OMIC technologies; inventions and discoveries; basic research; information technologies; electronics; drug discovery; mathematics; emerging technologies; fabrication; transport system; waste management; infrastructure; water systems; simulation studies; industrial and allied technology
8	Sustainable Entrepreneurship and Management	Entrepreneurship; economics; micro and macro scale business; product development; marketing; commercialization; networking; franchising; financial management; business feasibility studies; risk and opportunities; value adding; value chain analysis; organizational management; quality service assessment; human resource management; production management

USM website: https://www.usm.edu.ph/rde/vp/#1650853156562-4c5171ed-5b4e

- Present the Institution's approved Extension Manual





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

CONSULTANT
Francisco Gil N. Garcia

EDITORS
Ma. Teodora N. Cabasan
Debbie Marie B. Verzosa
Bryan Lloyd P. Bretaña
Glyn G. Magbanua
Jennifer E. Sinco

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usmvprde@usm.edu.ph

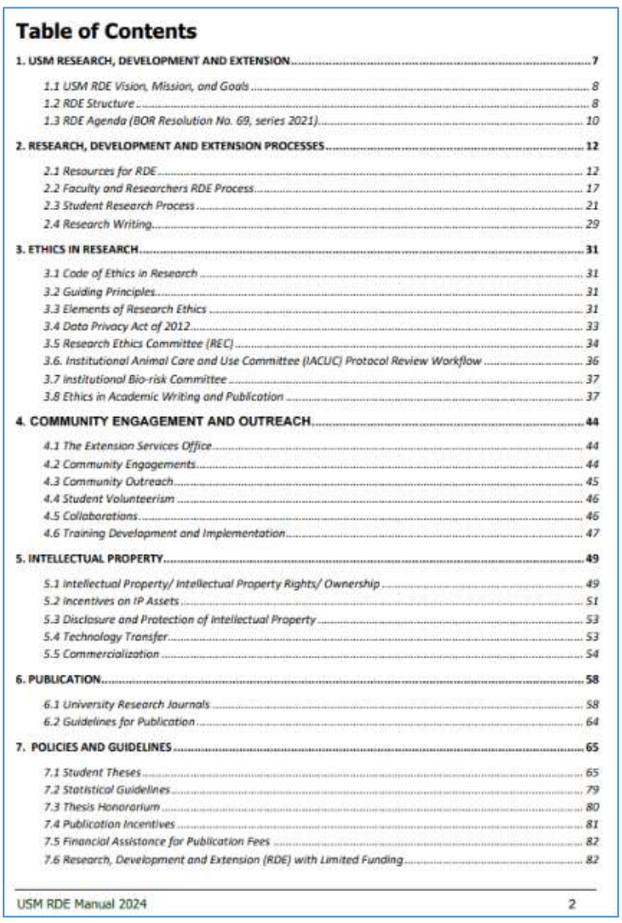
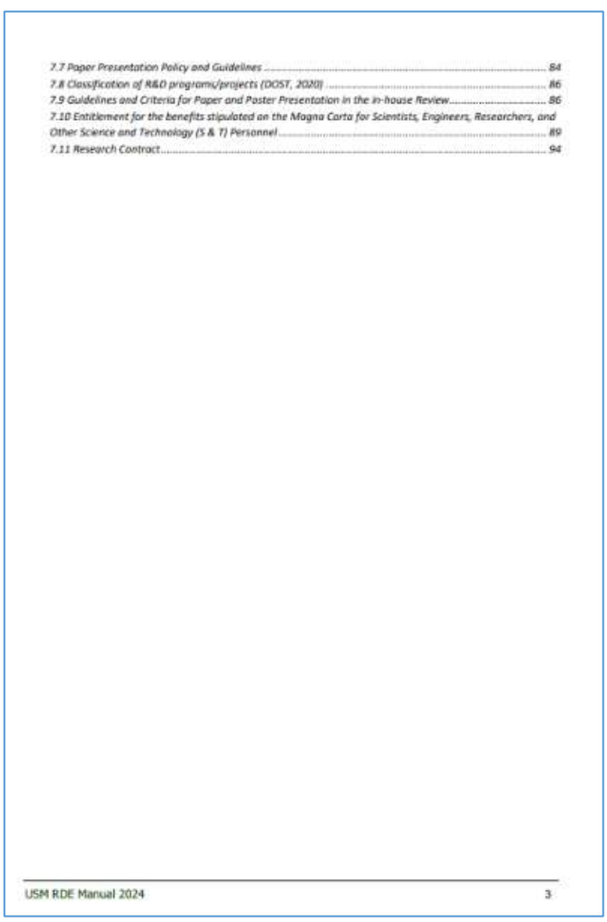


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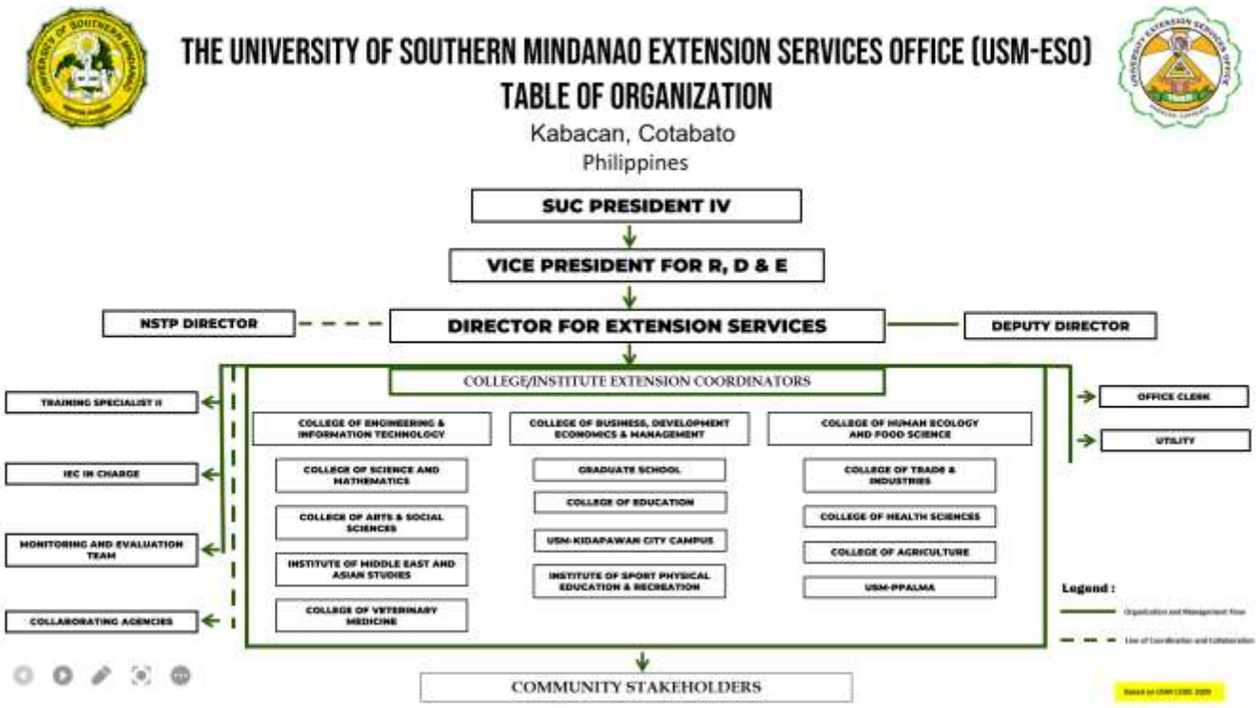
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Copy of USM RDE Manual 2024: https://drive.google.com/file/d/1p4l5JncGSNNHwTQHNXf-6OV4uQr24JIo/view?usp=sharing

- Present the duly approved organizational structure of the Extension Program



Can be viewed in USM website: https://www.usm.edu.ph/rde/vp/eso-who-we-are-what-we-do-our-services/#1668859818220-f7b1c147-318e

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



Glyn G. Magbanua
Graduate School Extension Coordinator



Marjurie V. Catuguran
CTI Extension Coordinator



Agripino N. Agulo Jr
CHS Extension Coordinator



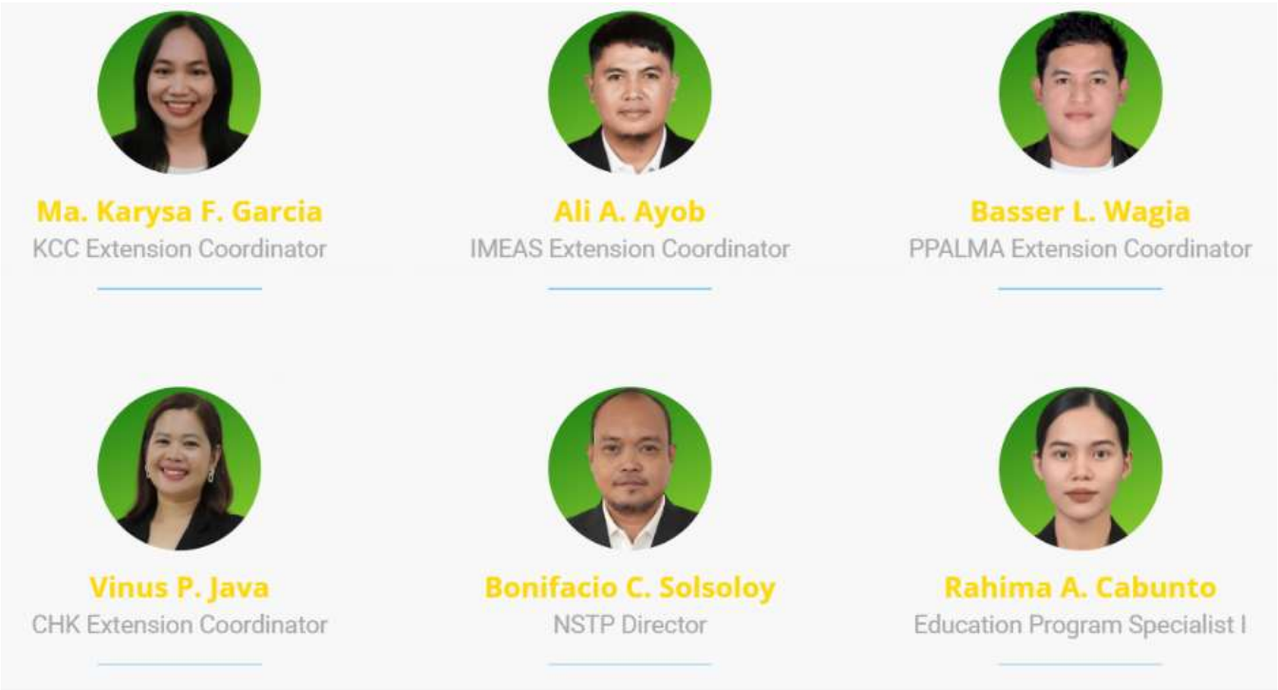
Josephine C. Martinez-Buison
COM Extension Coordinator

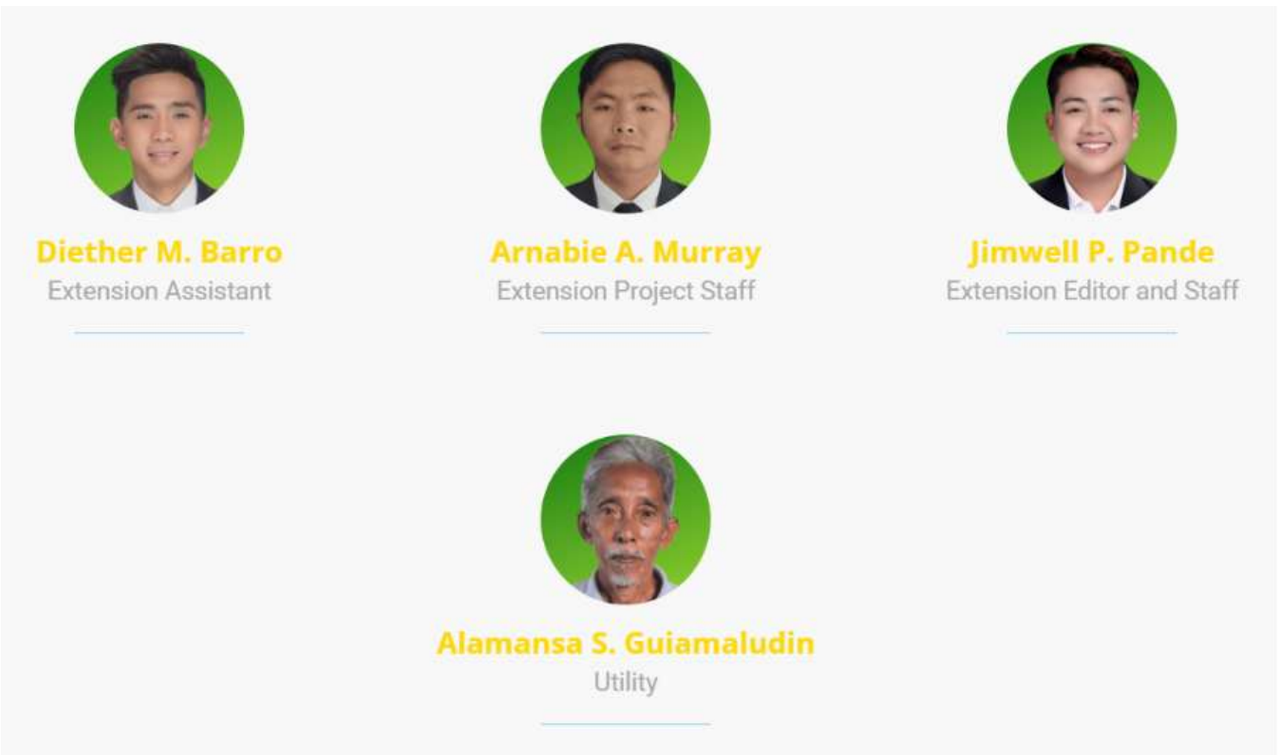


Avegale S. Roy
CHEFS Extension Coordinator



Jassen Fe C. Calaoagan
CEIT Extension Coordinator



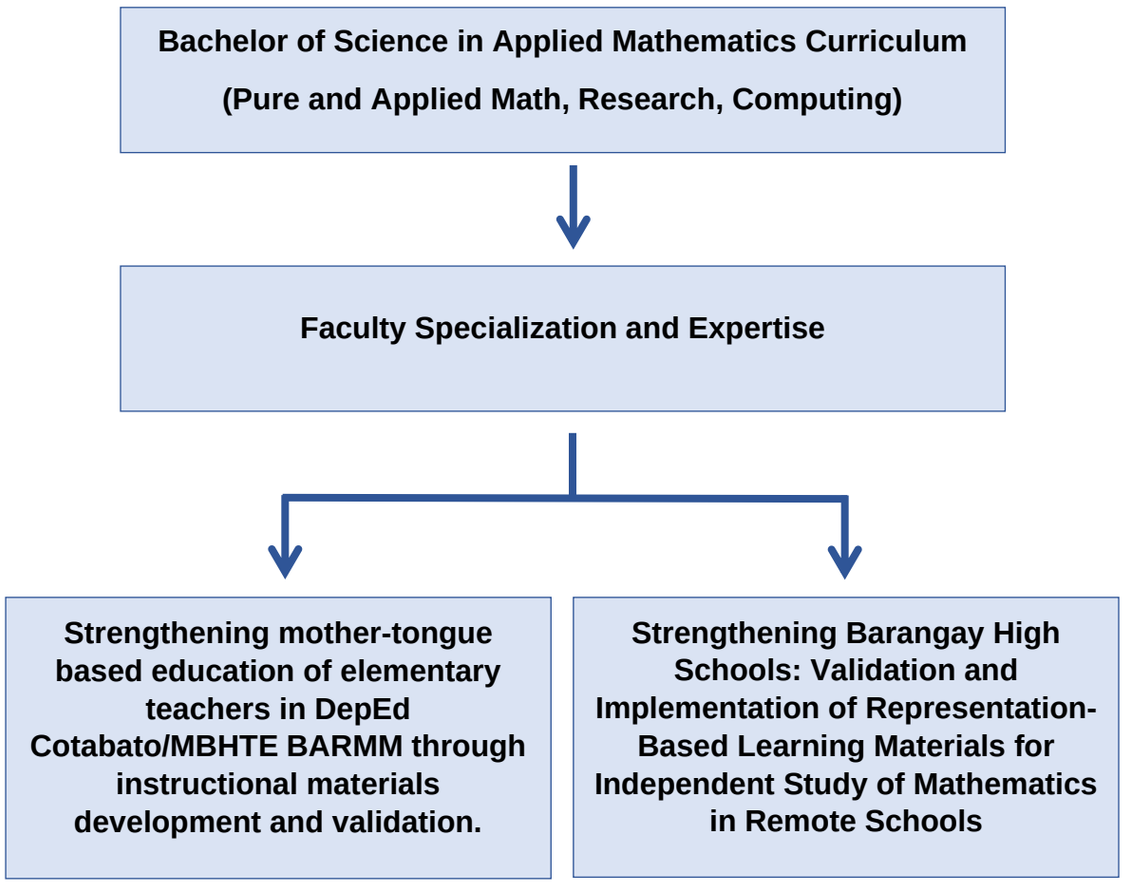


Can be viewed in USM website: https://www.usm.edu.ph/rde/vp/eso-who-we-are-what-we-do-our-services/#

2. IMPLEMENTATION

- Describe the complementation of the curricular/program and the extension projects/activities

The Extension Program of the Department of Mathematics and Statistics / College of Science and Mathematics at the University of Southern Mindanao is directly rooted in and driven by the academic core of the Bachelor of Science in Applied Mathematics curriculum. Rather than conducting isolated or one-off outreach activities, the department's extension initiatives bridge classroom instruction, faculty specializations, and student competencies with the actual operational needs of partner schools across DepEd Cotabato and MBHTE BARMM.



While the Department of Education (DepEd) provides broad-spectrum, centralized teaching materials and division-wide professional development trainings, the USM Extension Program fills a critical operational gap by addressing school-specific and context-dependent needs.

Recognizing that blanket national programs often fail to account for unique learner demographics, local dialects, and resource constraints in remote barangay schools, USM's Mathematics faculty apply their specialized background to:

1. Analyze the precise numeracy hurdles of a specific target school rather than applying broad assumptions.
2. Create mother-tongue based mathematics materials and Representation Approach-Based Learning Activity Pages (LAPs) for independent study that match the actual background and reading levels of students in remote communities.
3. Empower local teachers through component-based capacity building to conduct action research directly within their own classrooms, solving hyper-local instructional challenges that standard DepEd seminars do not cover.

The core mathematical, pedagogical, and computational competencies embedded in the BS Applied Mathematics curriculum map directly drive project implementation:

- ✓ Core foundational subjects like *Fundamental Concepts of Mathematics* enable faculty to translate complex mathematical concepts into simplified, student-centered learning modules.
- ✓ Competencies in statistics and quantitative research support Component 2 of the 2023 extension project and Component 2 of the 2025 extension project. Faculty apply rigorous data validation frameworks to analyze feedback from teachers, students, and parents to verify learning improvements.
- ✓ Coursework in *Fundamentals of Computing I & II* facilitates the digital packaging, formatting, online uploading, and copyrighting of Learning Activity Pages (LAPs) and lesson exemplars.

The execution of these extension projects feeds back into the BS Applied Mathematics program:

1. Authentic classroom challenges documented in remote barangay schools serve as real-world case studies for undergraduate math seminars and statistical analysis projects.
2. Practical gaps in basic numeracy identified during field implementation inspire undergraduate capstone projects and graduate research theses in the College of Science and Mathematics.

Attachments:

Curriculum Map: https://drive.google.com/file/d/19jd6BB82EmkWnWOmi4tSIofueUOVrwu0/view?usp=drive_link

Detailed Proposals: https://drive.google.com/file/d/1dPdXKjlX3idICP8NQEO2RE7Am5fXPSb7/view?usp=drive_link

Terminal Reports: https://drive.google.com/file/d/1bfErfzE9xjBeV4H9MNMDj3dpvAO9bvdK/view?usp=sharing

- Describe the process of development of the institutional extension program/agenda

The development and execution of the Extension Program/Agenda in the Department of Mathematics and Statistics / College of Science and Mathematics strictly follows the university-wide Standard Operating Procedures (SOPs) defined in the USM Research, Development, and Extension Manual (2024). This systematic process ensures that all extension initiatives are needs-driven, methodologically sound, ethically compliant, and approved through official institutional channels.

1. **Needs Assessment & Problem Identification**
   - ☐ Training Needs Assessment (TNA) & Community Surveys
   - ☐ Identification of target school/community gaps



2. **Extension Agenda Alignment & Capsule Proposal Creation**
   - ☐ Draft proposal mapped to USM RDE Agenda
   - ☐ Submission to College Extension Coordinator



3. **Institutional Review & Evaluation**
   - ☐ Initial screening by College Extension Committee / Dean
   - ☐ Technical & Plagiarism/AI screening by Extension Services Office
   - ☐ Technical presentation to URDEC



4. **Formal Approval & Execution Administrative Tools**
   - ☐ Approval by University President & VPRDE
   - ☐ Issuance of Notice to Proceed (NTP), Special Orders, and Contract
   - ☐ Signing of MOA/MOU with Partner Agencies



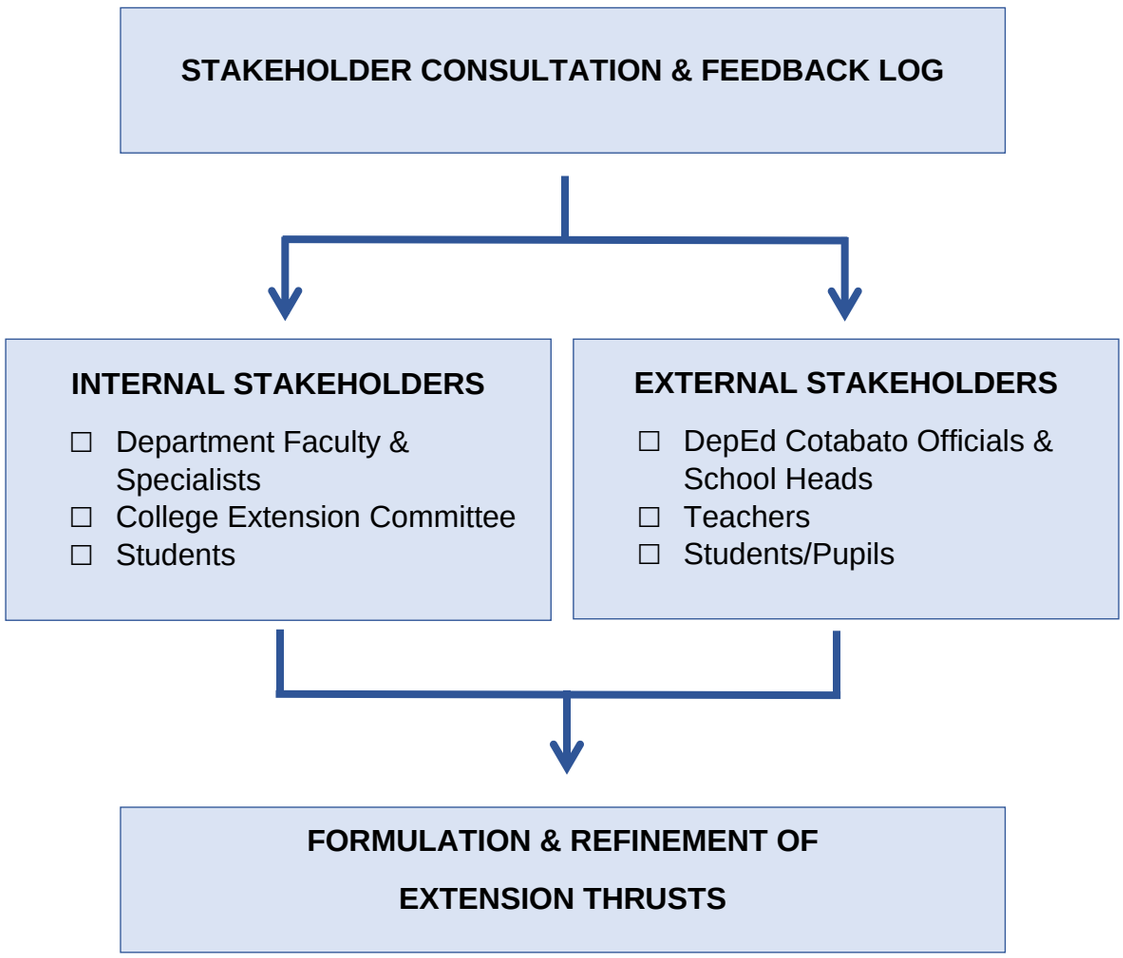
5. **Operational Planning & Project Execution**
   - ☐ Preparation of detailed Work Plan Schedule
   - ☐ Workload/Topic Assignments & Coordination Meetings
   - ☐ Rollout of Training/Extension Activity



6. **Monitoring, Evaluation, and Terminal Reporting**
   - ☐ Quarterly M&E Reports submitted to ESO / Monitoring Team
   - ☐ Presentation in Midyear/Year-end In-House Reviews
   - ☐ Submission of Terminal Report & Publishable Output

- Describe the congruence between the Describe the stakeholders' participation in the formulation of the Extesion Agenda

The formulation, implementation, and continuous refinement of the Extension Agenda at the Department of Mathematics and Statistics / College of Science and Mathematics relies on a collaborative, multi-stakeholder consultative process. Rather than imposing top-down academic initiatives, the department engages internal university personnel alongside external community leaders, school administrators, and classroom teachers. This participatory framework ensures that mathematics and statistics extension programs directly solve real classroom challenges, teacher shortages, and regional numeracy gaps in DepEd Cotabato and nearby divisions.



ROLES OF EACH STAKEHOLDERS

❖ **For Internal Stakeholders**

Department Faculty & Subject Experts: Serve as technical consultants, content reviewers, and lead extensionists.

Graduate Students (PhD Ed Math & MST Math): Actively participate in collaborative lesson study and material design. They co-develop, validate, and field-test self-instructional Learning Activity Pages.

Undergrad Student Volunteers: Assist in diagnostic test administration, coaching (e.g., Damath competitions), and field deployment across remote barangay schools.

❖ **For External Stakeholders**

DepEd Division Officials & School Heads: Principals grant administrative approvals, co-sign MOAs/MOUs, provide baseline diagnostic records, and integrate extension schedules into Friday class routines.

Teachers: Participate directly in Training Needs Assessments, Focus Group Discussions, and capacity-building workshops. They identify topics where students struggle most and critique draft instructional materials.

Student Beneficiaries: Elementary pupils and high school students complete diagnostic assessments, pilot-test Learning Activity Pages, and provide feedback on instruction pacing and material usability.

ENGAGEMENT OF STAKEHOLDERS

- ☐ Site visits and Training Needs Assessments identify specific instructional gaps, such as teacher shortages and difficulties teaching fractions or basic number sense.
- ☐ Teachers actively collaborate in seminar-workshops to create Learning Activity Pages tailored to their classrooms.
- ☐ Continuous evaluation forms and joint review meetings refine ongoing activities and future agenda cycles.

Attachments

Minutes of the Meeting: https://drive.google.com/file/d/1a1E5zxFE_gtTc1o3p9GqvZPZEy-KNO_y/view?usp=drive_link

Detailed Proposal: https://drive.google.com/file/d/1dPdXKjlX3idICP8NQEO2RE7Am5fXPSb7/view?usp=drive_link

Extension file: https://drive.google.com/file/d/13gmG2srqLYJ525Vh8stFqRNvMXHXXqTP/view?usp=drive_link

Documentation: https://web.facebook.com/share/p/16JRz9gxMX5/

- Describe the stakeholders' participation in the formulation of the Extension Agenda
  - ☐ The Institution's Extension Program/Agenda for the program under survey.

Program	Objectives	Specific Project/Activity	Strategy of Implementation	Location/Site	No. of Clientele	Project Implementor/s	Funding Source	Collaborating Agency
Mathematics Education	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.	Strengthening mother-tongue based education of elementary teachers in DepEd Cotabato/MBHTE BARMM through instructional materials development and validation	1. Needs assessment. 2. Materials drafting. 3. Training-workshop 4. Pilot testing & validation.	Nangaan ES, DepEd Cotabato	12 Teachers 150 Pupils and Parents	Philip Lester P. Benjamin, Sandra A. Nanding, et al.	USM Extension Fund	DepEd Cotabato / MBHTE BARMM / Nangaan ES
Community Education & Basic Math Literacy	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.	Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools	1. Baseline RMA assessment. 2. Training-workshop 3. Pilot testing & validation. 4. LAP deployment & college prep.	Salvacion HS, Matalam, Cotabato	174 Teachers, Grades 7–12 Students	Dr. Leorence C. Tandog, et al.	USM Extension Fund	DepEd Cotabato / Salvacion HS

Attachments

Minutes of the Meeting: https://drive.google.com/file/d/1a1E5zxFE_gtTc1o3p9GqvZPZEy-KNO_y/view?usp=drive_link

Detailed Proposal: https://drive.google.com/file/d/1dPdXKjlX3idICP8NQEO2RE7Am5fXPSb7/view?usp=drive_link

Project file: https://drive.google.com/file/d/13gmG2srqLYJ525Vh8stFqRNvMXHXXqTP/view?usp=drive_link

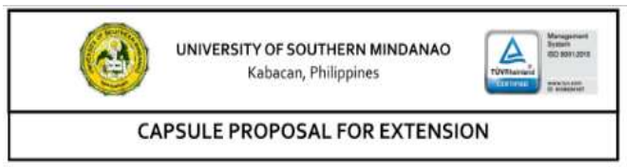
Documentation: https://web.facebook.com/share/p/16JRz9gxMX5/

3. OUTCOMES

- Present/Show evidences that priority and relevant extension projects and activities are conducted.

The Department of Mathematics and Statistics / College of Science and Mathematics consistently executes extension initiatives that address urgent regional numeracy challenges, align with university priority agendas, and generate measurable, high-impact outcomes for basic education beneficiaries.

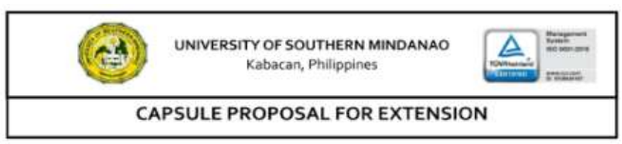
All extension projects fall directly under the approved USM RDE Thematic Area 1: Quality Learning, Skills Development, and Literacy (BOR Resolution No. 69, s. 2021) and align with UN Sustainable Development Goal #4 (Quality Education).



UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Philippines

CAPSULE 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	Building Capacity for Teachers in Instructional Development
Component 2	Building Capacity for Teachers in the Conduct of Action Research
Component 3	Design and Development of Representation Approach-Based Learning Materials for Independent Learning of Mathematics
Component 4	Validation and Packaging of Representation Approach-Based Learning Materials for Independent Learning of Mathematics
Component 5	Implementation of Representation Approach-Based Learning Materials for Improved Learning of General Mathematics
2. Proponent/s Indicate Name Designation, Office	Leorence C. Tandog, Debbie Marie Verzosa, Jonald Pimentel Philip Lester Benjamin, Leonard Paleta, Anna Jean Sebastian, Jupiter Pilongo, Daryl Mae Catubig, Lawton Yabes, Roel Valenton, Shandra Nanding, Rowel Madio Faculty, College of Science and Mathematics
2.1. Email Address	lctandog@usm.edu.ph
2.2. Contact Number	09466115568
3. Lead Unit/College	College of Science and Mathematics
3.1. Collaborating Unit/College	USM Graduate School
3.2. Partner Agency	



UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Philippines

CAPSULE PROPOSAL FOR EXTENSION

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. Sector/Discipline	Mathematics Education
6. Project Duration	One year
7. Project Service Area/s:	DepEd Cotabato
8. Total Budget Requested (Php)	50,000

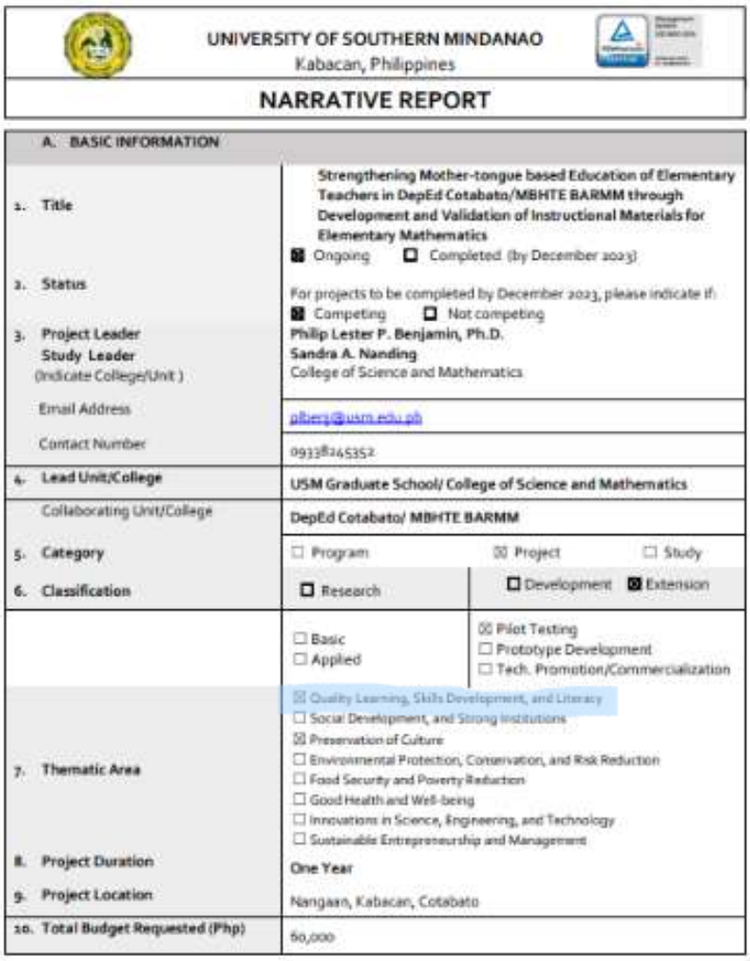
B. TECHNICAL DESCRIPTION

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.

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.



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

Extension Projects Conducted

Year	Project Title	Beneficiary / Site	Activities Conducted	Outputs
2023	Strengthening mother-tongue based education of elementary teachers in DepEd Cotabato/MBHTE BARMM through instructional materials development and validation	Nangaan Elementary School, DepEd Cotabato	Needs Assessment/ Meetings Training-workshop Development and Validation of IM	8 localized instructional materials (comics)
2025	Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools	Salvacion High School, Matalam, Cotabato	Training-Workshops Implementation of self-instructional LAPs College admission test review	11 Representation-based Learning Activity Pages

Terminal Reports:

https://drive.google.com/file/d/1mo34q-UcLhrnda8f-zM4Eyi-b8lEFgAg/view?usp=drive_link

https://drive.google.com/file/d/1bfErfzE9xjBeV4H9MNMDj3dpvAO9bvdK/view?usp=drive_link

3. BEST PRACTICES

- Cite as many best practices as you can on Parameter A (Priorities and Relevance).

1. Alignment with National, Regional, and Institutional Agendas

- ✓ Extension projects are explicitly aligned with USM RDE Thematic Area 1: Quality Learning, Skills Development, and Literacy (BOR Resolution No. 69, series 2021) and UN Sustainable Development Goal #4 (Quality Education).

- ✓ All project proposals undergo administrative and technical evaluation by the University Research Development and Extension Committee (URDEC) and receive an official Notice to Proceed (NTP) prior to field deployment.

2. Data-Driven Community Needs Assessment

- ✓ Project designs are built on direct baseline evidence. The department utilizes structured survey forms alongside diagnostic tools to identify exact learning gaps in target schools.

- ✓ Inception meetings, courtesy calls, and focus group discussions are conducted with DepEd division officials, barangay leaders, school heads, and teachers to ensure local relevance and community commitment.

3. Standardized Operations & Approved Manuals

- ✓ Extension activities strictly follow the copyrighted USM Research, Development, and Extension Manual (Revised 2024) approved via BOR Resolution No. 119, s. 2024.

- ✓ Implementation uses standardized institutional forms, including standard Capsule Proposals, Detailed Proposals (USM-EXT-F05), Attendance Logs, and Terminal Reports (USM-EXT-F15).

4. Multidisciplinary Teams & Student Integration

- ✓ Projects engage a multidisciplinary team holding advanced degrees in Mathematics, Applied Linguistics, and Animal Science.

- ✓ PhD in Education (Math) and Master of Science in Teaching (MST) Mathematics graduate students, alongside BS Applied Math students, serve as material co-designers, reviewers, and field implementors, directly linking university research to community service.

5. **Collaborative Learning Resource Development**

- ✓ University faculty work directly with basic education teachers to develop and refine Learning Activity Pages.

- ✓ Learning materials are built on established frameworks, including the Multiple Representation Approach, Concrete-Representational-Abstract, Representation Construction Approach, and Concept Attainment.

6. **Continuing Professional Development (CPD) & High Satisfaction**

- ✓ Workshop trainings are submitted for and awarded Professional Regulation Commission (PRC) Continuing Professional Development (CPD) accreditation.

- ✓ Post-activity evaluations consistently reflect high beneficiary satisfaction, achieving ratings between 4.71 and 4.88 out of 5.00 (Excellent).

7. **Continuous Improvement & Research Translation**

- ✓ Implementation follows a three-phase flow:
  - Pre-Implementation/Development
  - Implementation/Deployment
  - Evaluation/Refinement.

  Materials are pilot-tested and revised based on field feedback prior to wider rollout.

- ✓ Extension outcomes feed back into academic scholarship, resulting in completed Action Research studies and journal-ready manuscripts for publication.

PARAMETER B – PLANNING, IMPLEMENTATION, MONITORING and EVALUATION

1. SYSTEM-INPUTS AND PROCESSES

- Show the Office where the Extension Program is managed. (pictorial with caption)



Figure 1. *Office of the Director for Extension Services at the University of Southern Mindanao*



Figure 2. *College Extension Office*



Figure 3. *Departmental Extension Operations Area within the Faculty Office*

- Present approved extension instruments for monitoring and evaluation.

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

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



UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

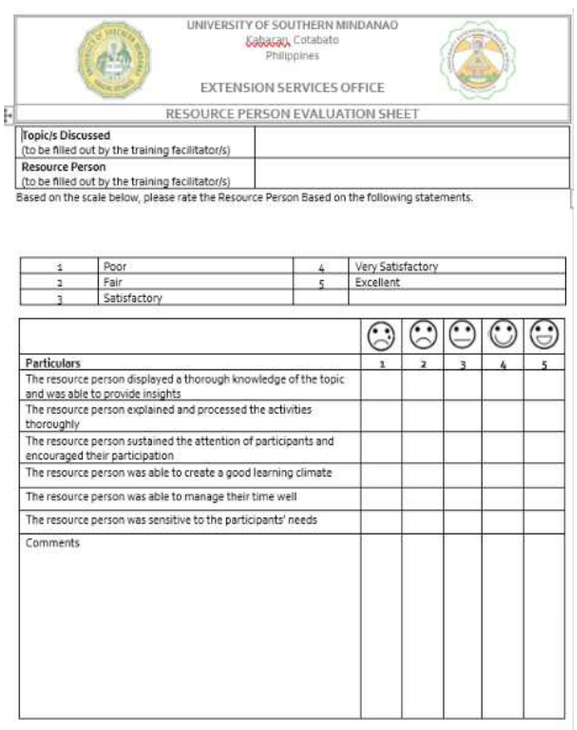
OVERALL TRAINING/ ACTIVITY EVALUATION SHEET

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): _____



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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		

	☹ 1	☹ 2	😐 3	🙂 4	😀 5
Particulars					
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					

Can be viewed in USM Website:
https://docs.google.com/document/d/1pz_XlwhY3wY75qJL5CdpjhflDqrDVKkj/edit?usp=drive_link&ouid=117590906191913124446&rtpof=true&sd=true

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

2. IMPLEMENTATION

- State the Profile of the Extension Program Heads

Head	Name	Educational Qualification	Specialization	No. of Years of Extension Experience
1. Institution's Extension Head	Glyn G. Magbanua	PhD in Applied Linguistics	Applied Linguistics	15
2. Academic Unit's Extension Head	Cherie C. Mangaoang	PhD in Biology	Systematics	15
3. Extenionist's	Leorence C. Tandog	PhD in Education (Mathematics)	Mathematics Education	35
	Jead M. Macalisang	PhD Mathematics	Mathematics Modelling	2
	Philip Lester P. Benjamin	PhD Mathematics	Graph Theory	10
	Sandra A. Nanding	MS Mathematics	Graph Theory	4

- Describe the participation of the administrativion, faculty, students and stakeholders in the planning of extension projects/activities

	Project/Activity	Nature of Involvement/Participation
1. Administration	Reviewing, Funding, and Official Approvals	Evaluates project proposals through the University Committee (URDEC). Confirms project alignment with university goals (BOR Res. No. 69, s. 2021). Releases project funds and approves official Notice to Proceed (NTP) documents. Oversees final terminal reports and official Client Satisfaction Surveys.
2. Faculty	Project Leadership, Training, and Research Writing	Leads project planning, inception meetings, and courtesy calls with local leaders. Conducts baseline needs assessments and diagnostic pre-tests/post-tests. Serves as resource speakers for teacher training workshops. Directs the development, validation, and pilot testing of Learning Activity Pages (LAPs). Supervises classroom implementation and writes final terminal/research reports

3. Students	Data Collection, Material Co-Design, and Field Support	BS/Master's/PhD students assist in running community surveys and pre-tests/post-tests. Co-designs and reviews supplementary learning activity worksheets and zines. Helps run pilot tests with small student groups to check material readability. Serves as field facilitators during weekly classroom material implementation and student review sessions.
4. Stakeholders	Needs Identification, Training Participation, and Field Pilot Testing	DepEd officials, school heads, and teachers attend inception meetings to share specific learning needs. Signs partnership agreements (MOA) and sets project activity schedules. Teachers actively participate in training workshops on material development and action research. Local teachers and students participate in pilot testing, field implementation, and post-activity satisfaction surveys

- Name all Extenison Projects implemented by the Program under survey within the last 3-5 years

Name of Project	Faculty Involved	Students Involved	Others Involved	Clientele/ Beneficiaries	Duration/Time Frame
1. Strengthening Mother-Tongue Based Education of Elementary Teachers in DepEd Cotabato through Instructional Materials Development and Validation	Dr. Philip Lester P. Benjamin (Project Leader) Prof. Sandra A. Nanding (Component Leader) Dr. Debbie Marie B. Verzosa Dr. Leorence C. Tandog Prof. Florie Jane Tamon Prof. Rowel Madio Prof. Roel Valenton Prof. Anna Jean Garcia	Manuel Lisondra Ivy Joy Benemerito Desiree G. Victoria Aladin M. Labas	Barangay Captain Hon. Lumambas School Principal Ma'am Salapudin DepEd Cotabato Officials Nangaan ES Teachers	Elementary Teachers Grade 1–3 Pupils, and Parents at Nangaan Elementary School	January 2023 – December 2023 (1 Year)

	Prof. Leonard Paleta Prof. Meriam Rubio Prof. Jeaneth Licaros Prof. Daryl Mae Mamon Dr. Jonald Pimentel Prof. Jennifer Pama Dr. Jupiter G. Pilongo Prof. Arnel B. Toledo Prof. Honey Vincent Valle				
2. Strengthening Barangay High Schools: Validation and Implementation of Representation Approach-Based Learning Materials for Independent Study of Mathematics in Remote Schools	Dr. Leorence C. Tandog (Project Leader) Prof. Leonard M. Paleta (Component 1 Leader) Dr. Debbie Marie B. Verzosa (Component 2 Leader) Dr. Philip Lester P. Benjamin (Component 4 Co-Leader) Dr. Jupiter G. Pilongo (Component 4 Co-Leader) Prof. Sandra A. Nanding Prof. Rowel Madio Prof. Lawton John Yabes Prof. Dominic Carajay	5 PhD in Education (Math) Students 5 MST Mathematics Students 5 DOST-SEI Project Strand-N Scholars 5 BS Applied Math Students	DepEd Cotabato Division Officials School Head & Teachers of Salvacion High School Ms. Aurea Puyos (Resource Speaker) Dr. Ian June Garces (Resource Speaker)	Teachers of Salvacion High School	January 2025 – March 2026 (1 Year & 3 Months)

	Prof. Lidey Sultan Dr. Jonald Pimentel Prof. Anna Jean Garcia Prof. Daryl Mae Mamon Prof. Jeaneth Licaros Prof. Roel Valenton Prof. Jennifer Pama Prof. Arnel Toledo				

- State the Research results utilized/adopted as Extension inputs for the program

Research Title	Researcher/s	Technology/Knowledge Generated	Extension Program/Activity/ Where Applied	Location/Site	No. of Clientele
N/A		**None**. Extension projects were initiated directly based on community Needs Assessments, Rapid Mathematics Assessments (RMA), and diagnostic test results rather than prior research outputs.			

- Pool Consultants/Experts

Name of Consultant/Expert	Specialization	Specific Expertise Extended	Extension Projects/Activity Served	Location/Site
1. **Ms. Aurea Puyos** (Senior Instructor, Notre Dame of Kidapawan College)	Mathematics Education	Plenary Talk 1: Action Research	Seminar-Workshop on Empowering Educators: Crafting Learning Materials and Implementing Design-Based Action Research (May 30–31, 2025)	Graduate School Hall, USM, Kabacan, Cotabato
2. **Dr. Ian June L. Garces** (Associate Professor, Ateneo de Manila University)	Mathematics	Plenary Talk 2: Writing Good Math Problems	Seminar-Workshop on Empowering Educators: Crafting Learning Materials and Implementing Design-Based Action Research (May 30–31, 2025)	Graduate School Hall, USM, Kabacan, Cotabato
3. Dr. Debbie Marie B. Verzosa (Professor, University of Southern Mindanao)	Mathematics Education	Plenary Talk 3: Development of Representation Approach - Learning Materials	Seminar-Workshop on Empowering Educators: Crafting Learning Materials and Implementing Design-Based Action Research (May 30–31, 2025)	Graduate School Hall, USM, Kabacan, Cotabato

4. Dr. Leorence C. Tandog (Professor / Vice President for Academic Affairs, USM)	Mathematics Education	Plenary Talk 4: Design-Based Research (Part 1)	Seminar-Workshop on Empowering Educators: Crafting Learning Materials and Implementing Design-Based Action Research (May 30–31, 2025)	Graduate School Hall, USM, Kabacan, Cotabato
5. Dr. Anna Jean S. Garcia (Associate Professor, University of Southern Mindanao)	Mathematics Education, Statistics	Plenary Talk 4: Design-Based Research (Part 2)	Seminar-Workshop on Empowering Educators: Crafting Learning Materials and Implementing Design-Based Action Research (May 30–31, 2025)	Graduate School Hall, USM, Kabacan, Cotabato

- List of Packaged Technologies

Title of Technology	Mode of Delivery (primer, brochure,film, etc)	Authors/Production Team
N/A		**None.** The Extension Program focuses on teacher capacity building, instructional material design (Learning Activity Pages/LAPs), and action research mentoring rather than commercialized or packaged technologies.

- Describe the feedback/evaluation mechanism from stakeholders/beneficiaries/clientele to improve the delivery of extension service.

The Extension Program collects feedback and improves service delivery through a specific three-step evaluation mechanism.

First, upon project completion, the program administers the CHED-approved Client Satisfaction Survey (CSS) mandated under CHED CMO No. 18 (2025) to participating teachers, school heads, and students. This quantitative evaluation yields an overall Grand Mean of 4.36 / 5.00 ("Excellent") and an official score of 87.2 / 100 across 10 specific indicators, including listening to suggestions (4.46), overall satisfaction (4.52), and willingness to recommend (4.50).

Second, the team gathers qualitative feedback through open-ended evaluation forms and holds face-to-face debriefing meetings with school principals and mathematics teachers to evaluate instructional clarity, pace, and worksheet difficulty.

Third, project implementors use these specific findings to refine ongoing service delivery: student feedback on difficult math concepts prompts the revision of Learning Activity Pages (LAPs) to add visual scaffolding, participant requests lead directly to adding topics like Algebra and problem-solving to future modules, and lower indicators regarding user adaptation trigger follow-up classroom visits and orientation support for partner schools.

3. OUTCOMES

- Present/Show evidences that 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.

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.

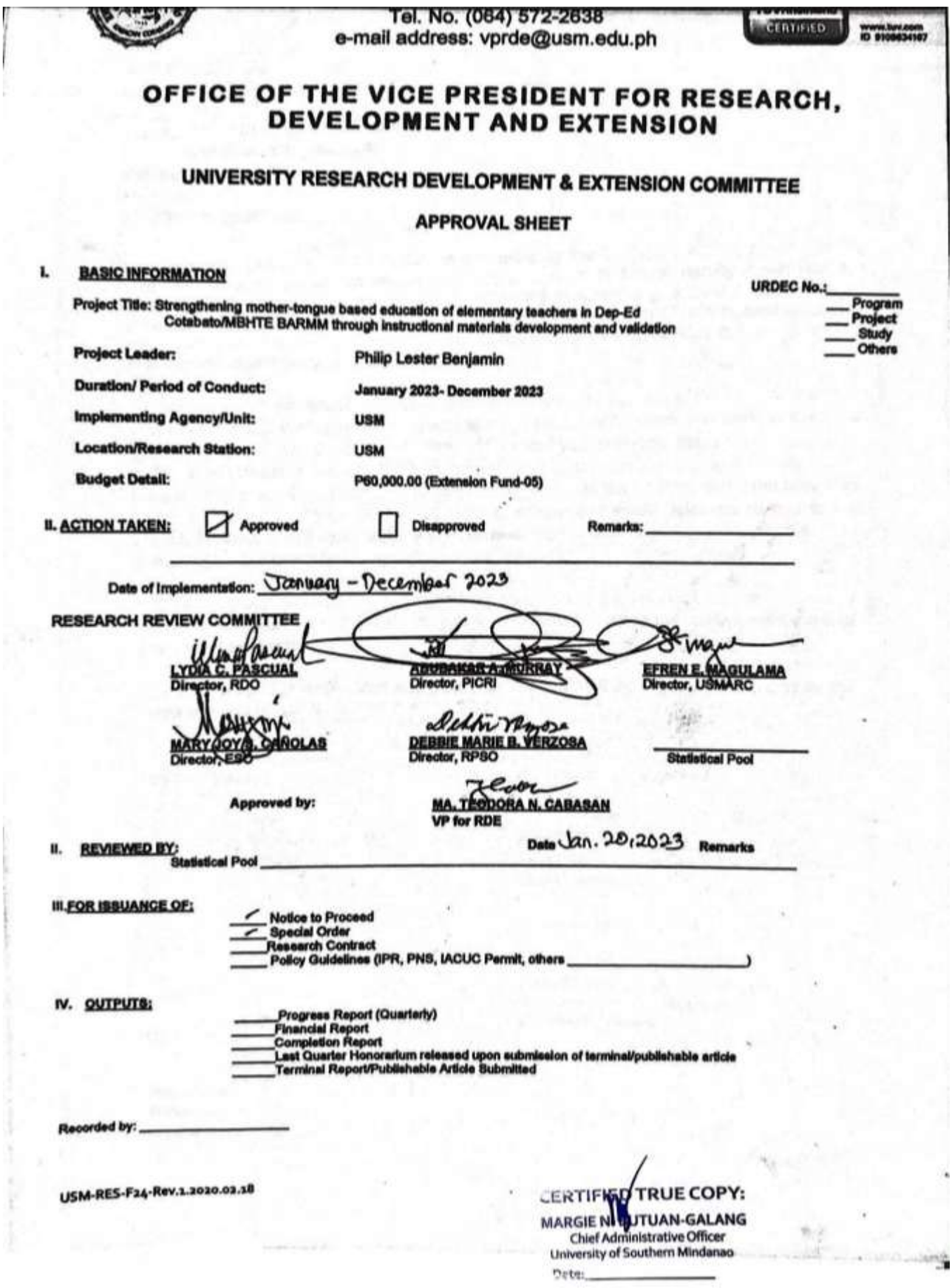
7. Work Plan

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

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. YERZOSA
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.1.2020.03.18

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

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 GIL 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.

5-11-23

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.

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

REPUBLIC OF THE PHILIPPINES
UNIVERSITY OF SOUTHERN MINDANAO

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: | BUDGET ALLOCATION:

CODE	OBJECT OF EXPENDITURE	ESTIMATED BUDGET	ESTIMATED BUDGET												TOTAL
			1ST Quarter			2nd Quarter			3rd Quarter			4th Quarter			
			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
	I. PERSONNEL SERVICES (PS)														-
	A. Other Professional Services	15,000.00			3,000			3,000			3,000.00			3,000	15,000
	B. Other General services	25,000.00									25,000.00				25,000
	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	13,393.86						13,393.86							13,394
	C. Office Supplies	5,606.40			5,606.40										5,606
	D. Procurement of Fuel, Oil, and Lubricants	6,600.00			6,600.00										6,600
	Sub-total for MOOE	35,000.00													-
															-
	TOTAL	60,000.00													60,000.00

Prepared By:
LEORENCE C. TANDOG
Project Leader

Certified By:
GLYN G. MAGBANUA, PhD
Director, ESO

Reviewed By:
SHEREEN MAE R. VILLAROZ
Budget Officer

Recommending Approval:
EMERITO ESTILLORE, EdD
VP for Administration & Finance
DEBBIE MARIE B. VERZOSA, PhD
VP for Research, Development and Extension

Approved By:
RODY P. GARCIA, MDM, JD, EdD
OIC-President

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

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	plbenj@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

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

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	albenj@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

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

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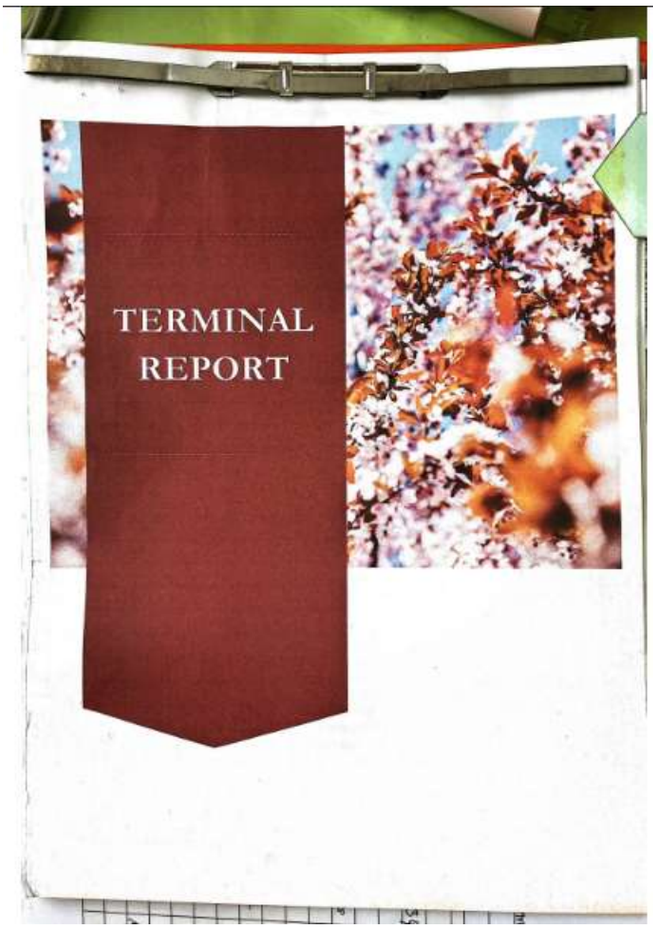
Work Plan

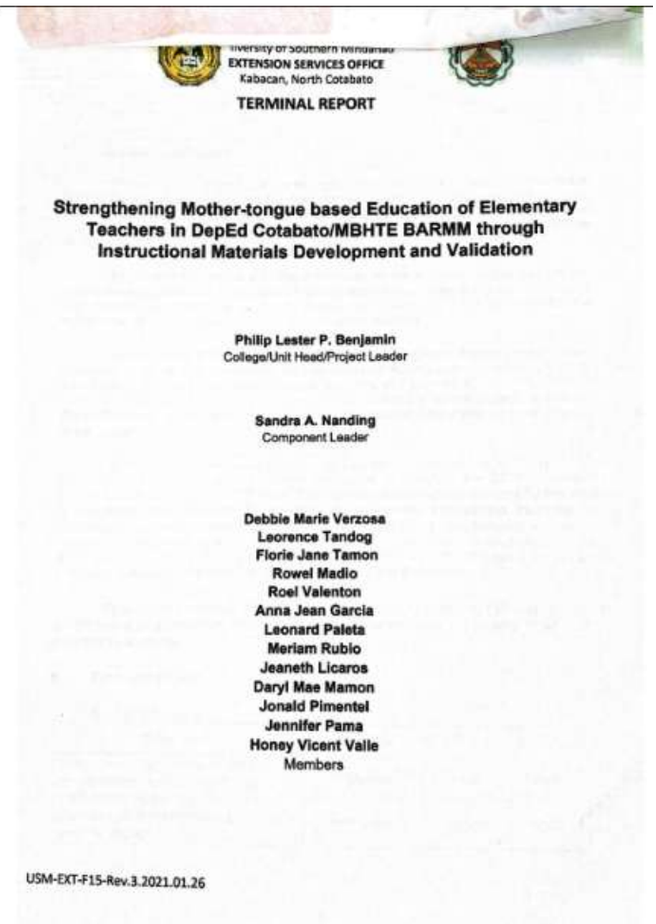
PROJECT TITLE: Strengthening mother-tongue based education of elementary teachers in DepEd Cotabato through instructional materials development and validation.

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 Madis	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 Lawrence Tuesday	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





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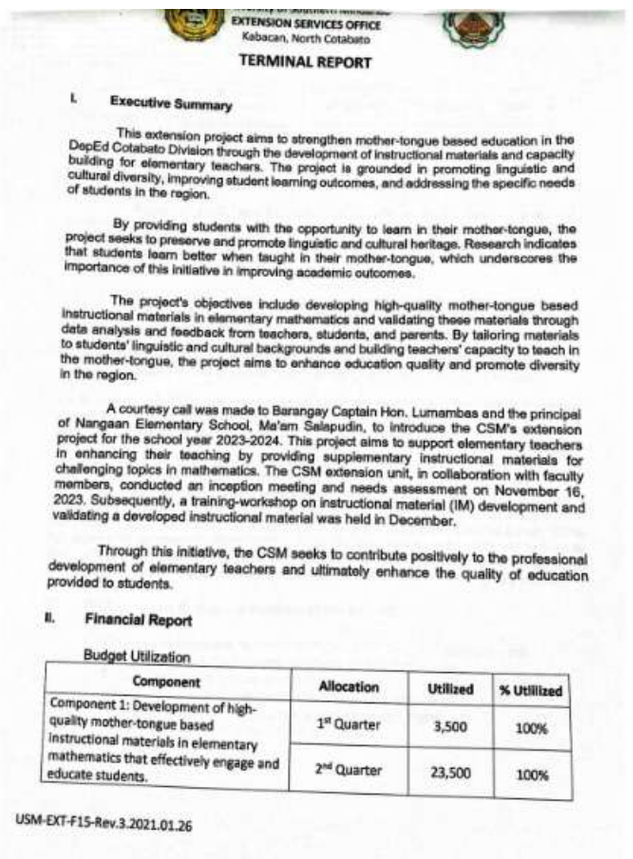
TERMINAL REPORT

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.

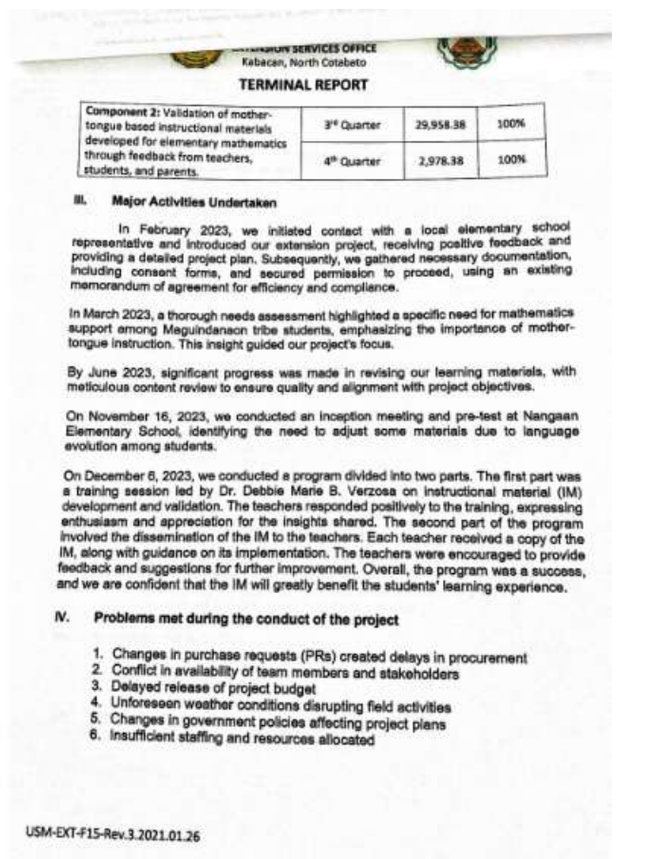
A courtesy call was made to Barangay Captain Hon. Lumambas and the principal of Nangaan Elementary School, Ma'am Salapudin, to introduce the CSM's extension project for the school year 2023-2024. This project aims to support elementary teachers in enhancing their teaching by providing supplementary instructional 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%



EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

TERMINAL REPORT

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

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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Kabacan, North Cotabato

TERMINAL REPORT

IX. Pictorials





Inception Meeting with Teachers of Nangaan Elementary School



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Kabacan, North Cotabato

TERMINAL REPORT





Conduct of needs assessment and Pre-test



Visit at Nangaan Elementary School

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Kabacan, North Cotabato

TERMINAL REPORT



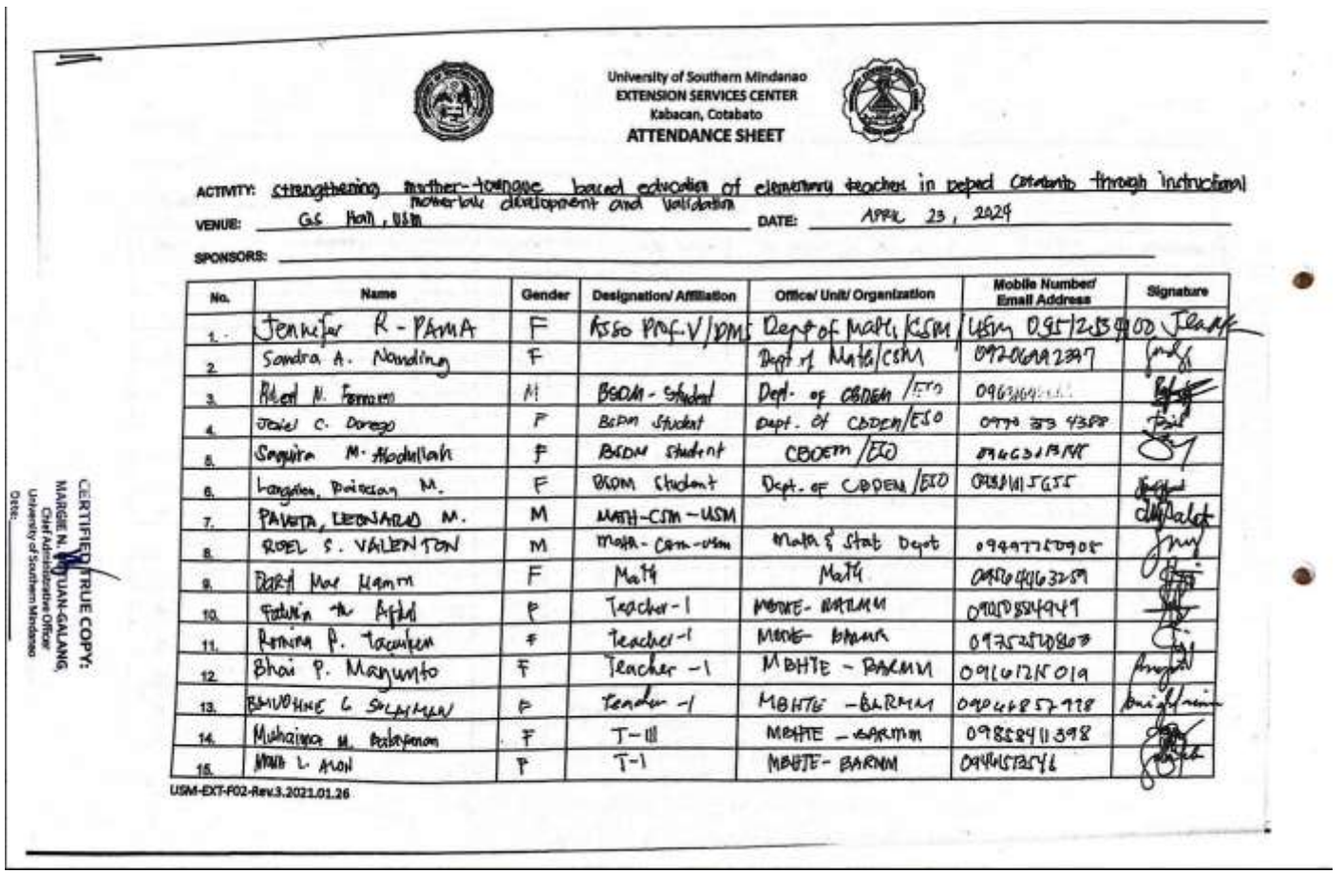


Training on IM Development and Validation of IM with the resource person Dr. Verzosa.



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8. Attendance



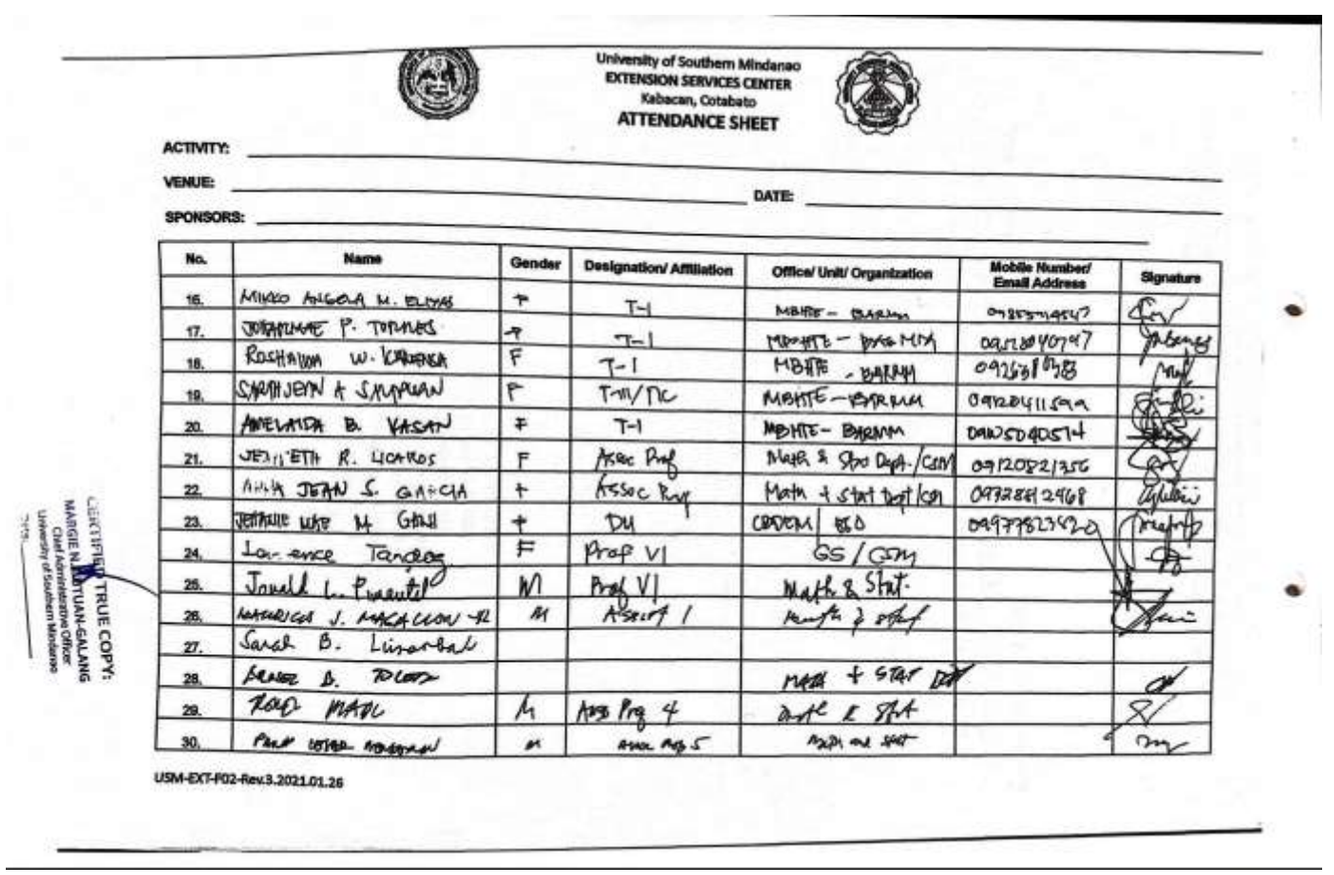
University of Southern Mindanao
EXTENSION SERVICES CENTER
Kabacan, Cotabato
ATTENDANCE SHEET

ACTIVITY: Strengthening mother-tongue based education of elementary teachers in 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/DM	Dept of Math, CSM	USM 09512539400	
2.	Sandra A. Nanding	F		Dept of Math/CSM	09206882397	
3.	Rhea N. Formen	M	BSEM - Student	Dept. of CBDEM/ESO	09631694...	
4.	Jeiel C. Dorego	F	BEEM Student	Dept. of CBDEM/ESO	0970 373 4388	
5.	Saquira M. Abdullah	F	BSEM student	CBDEM/ESO	09463188NT	
6.	Langales, Princess M.	F	BSEM Student	Dept. of CBDEM/ESO	09381115655	
7.	PAMATA, LEONARDO M.	M	MATH-CSM-USM			
8.	ROEL S. VALENTON	M	Math-Csm-usm	Math & Stat Dept	09497760905	
9.	Beryl Mae Llamin	F	Math	Math	09506416325	
10.	Fatima M. Ayad	F	Teacher-1	MBHTE-BARMM	09105854947	
11.	Reming P. Tacuiken	F	Teacher-1	MBHTE- BARMM	09752520803	
12.	Bhai P. Manguntu	F	Teacher -1	MBHTE - BARMM	09161215019	
13.	BENJAMIN L SOLAIMAN	M	Teacher -1	MBHTE -BARMM	09064857998	
14.	Mushaima M. Balayaman	F	T-III	MBHTE - BARMM	09852411398	
15.	MAIN L. AMIN	M	T-1	MBHTE- BARMM	09445125716	

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



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 ANGELA M. ELIVAS	F	T-1	MBHTE - BARMM	09853714547	
17.	JOSEPHINE P. TOPINES	F	T-1	MBHTE - BARMM	09128940747	
18.	ROSHAIDA W. KAMENDA	F	T-1	MBHTE - BARMM	09263180183	
19.	SARAH JEAN A SALAMAN	F	T-III/TIC	MBHTE - BARMM	09128411599	
20.	AMELANDA B. KASAN	F	T-1	MBHTE - BARMM	09105040514	
21.	JEZIL ETH R. LICAROS	F	Assoc Prof	Math & Stat Dept./CSM	09120521356	
22.	ANNA JEAN S. GARCIA	F	Assoc Prof	Math & Stat Dept/CSM	09328812468	
23.	JEFFREY WAY M. GAWI	M	DM	CBDEM/ESO	09979523420	
24.	Lawrence Tandog	M	Prof VI	GS/CSM		
25.	Jonald L. Pimentel	M	Prof VI	Math & Stat.		
26.	MARGRICOR J. MACALLON-AS	M	Assoc I	Math & Stat		
27.	Sarah B. Lisarbal					
28.	BRENZE D. DOCOT			MATH & STAT DEPT		
29.	ROLO MATIC	M	Asst Prof 4	Math & Stat		
30.	PRINCESS LOUISE MONTEMAYOR	F	Assoc Prof 5	Math and Stat		

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MARGIE N. BUTUAN-GALANG
Chief Administrative Officer
University of Southern Mindanao
Date:

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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UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Philippines

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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.

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

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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Kabacan, Cotabato
Philippines

EXTENSION SERVICES OFFICE

DETAILED PROPOSAL FOR EXTENSION

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.)

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

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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Kabacan, Cotabato
Philippines

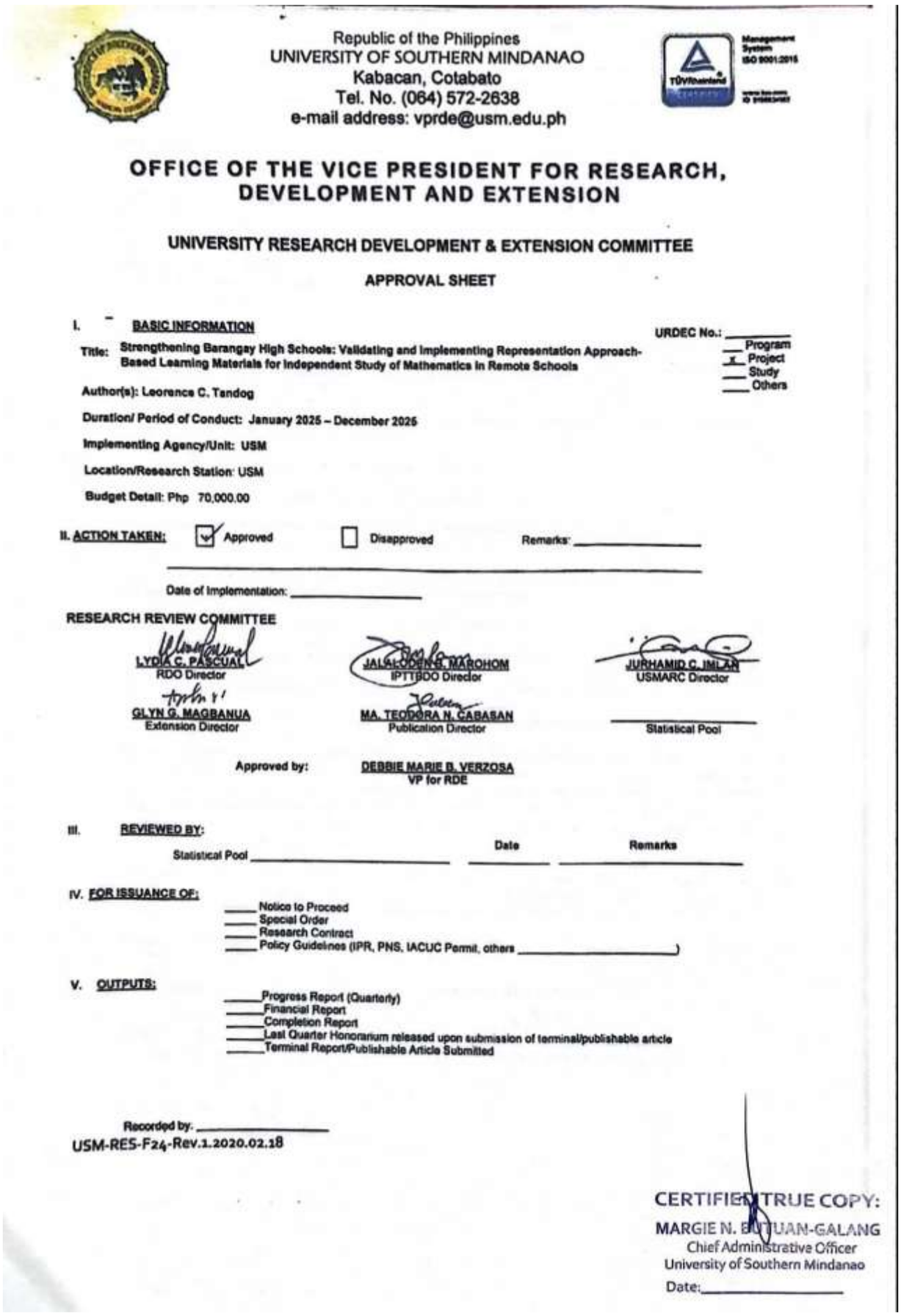
EXTENSION SERVICES OFFICE

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%

USM-EXT-F11-Rev.4 2024.09.02

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

Management System ISO 9001:2015

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 2025

Implementing Agency/Unit: USM

Location/Research Station: USM

Budget Detail: Php 70,000.00

II. **ACTION TAKEN:** [x] Approved [ ] Disapproved Remarks: _____

Date of Implementation: _____

RESEARCH REVIEW COMMITTEE

LYDIA C. PASCUAL
RDO Director

JALALODEN 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:**

Statistical Pool _____ Date _____ Remarks _____

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: _____

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.

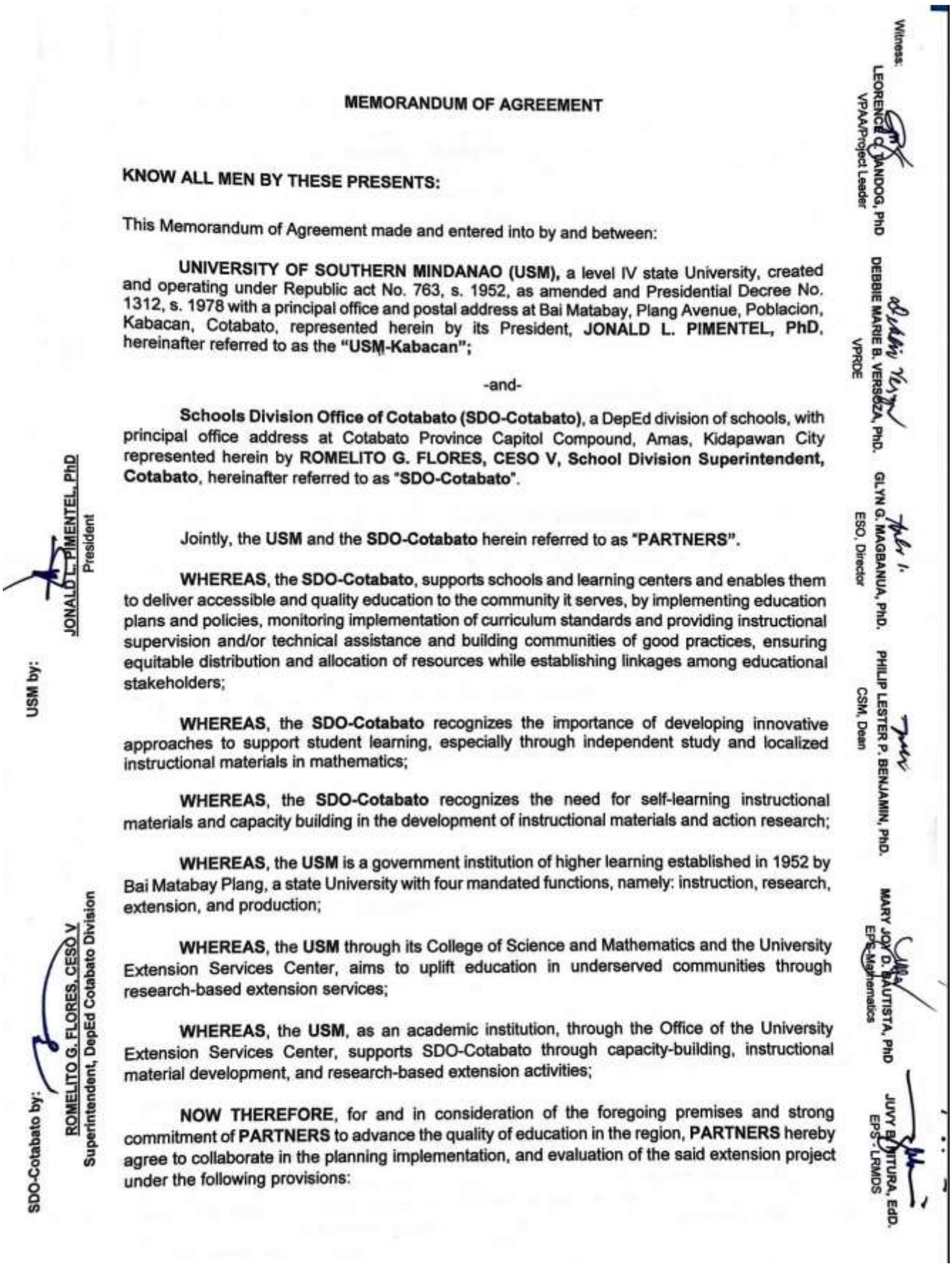
Approved by:

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:

Witness:

LEORENCE C. LANDOG, 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. BITURA, 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.

USM by:
JONALD L. PIMENTEL, PhD
President

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

Witness:
LEORENCE C. TALUDOG, 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. MITURA, 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)	UNIVERSITY OF SOUTHERN MINDANAO (USM)
ROMEO 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 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

Doc. No. 78;
Page No. 78;
Book No. 49
Series of 2026.

NOTARY PUBLIC REGERICK L. BENITO

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

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 | Sir Ivan Inattur & Linguistics
- to attend | withdraw not related
- training design
- learning materials

1.) Needs assessment - interview teachers c/o Ryan Flores — their topic that they need

2.) Capacity building
2 days
Workshop
speaker : lecturer online
topics: mathematics teaching in development
Non-routine problems
Ian Garcia (online) / Flor Francisco
Debbie Verzosa
Leorina Tandog
Janeth Lisno] Re-echo ICME@Athens
Tentative Date: May 30-31, 2025 [Fri & Sat]
Venue: Graduate School

- Ark w/ CP Register ID, ID, Afraid about official receipts

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

Topic: [SEMINAR]
1.) Development of representation approach - learning materials [Debbie Verzosa]
May 30, 8:30 - 10am / GS Hall
2.) Writing good math problems [Ian Garcia w/ Real Math] lead
May 30, 10:30am - 12nn / GS Hall
3.) Workshop
1-3 pm
4.)
a. Action research [Aaron Pages]
May 30, 3pm / GS Hall
b. Design-based research [Leorina Tandog w/ Janeth Lisnio]
May 31, 8:30 am - Room
5.) Workshop
Time: 10:30am

Committee:
Instructional Design / Application form / Event Poster - [Ramel Aaron Sandra]
Compile CVs in PRC template - Lawton Justin
Financial projection - Daryl Marvin
Certificates - Lawton / Justin -
Pub Mat - Benjamin
Program of activities - Rod
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



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/



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

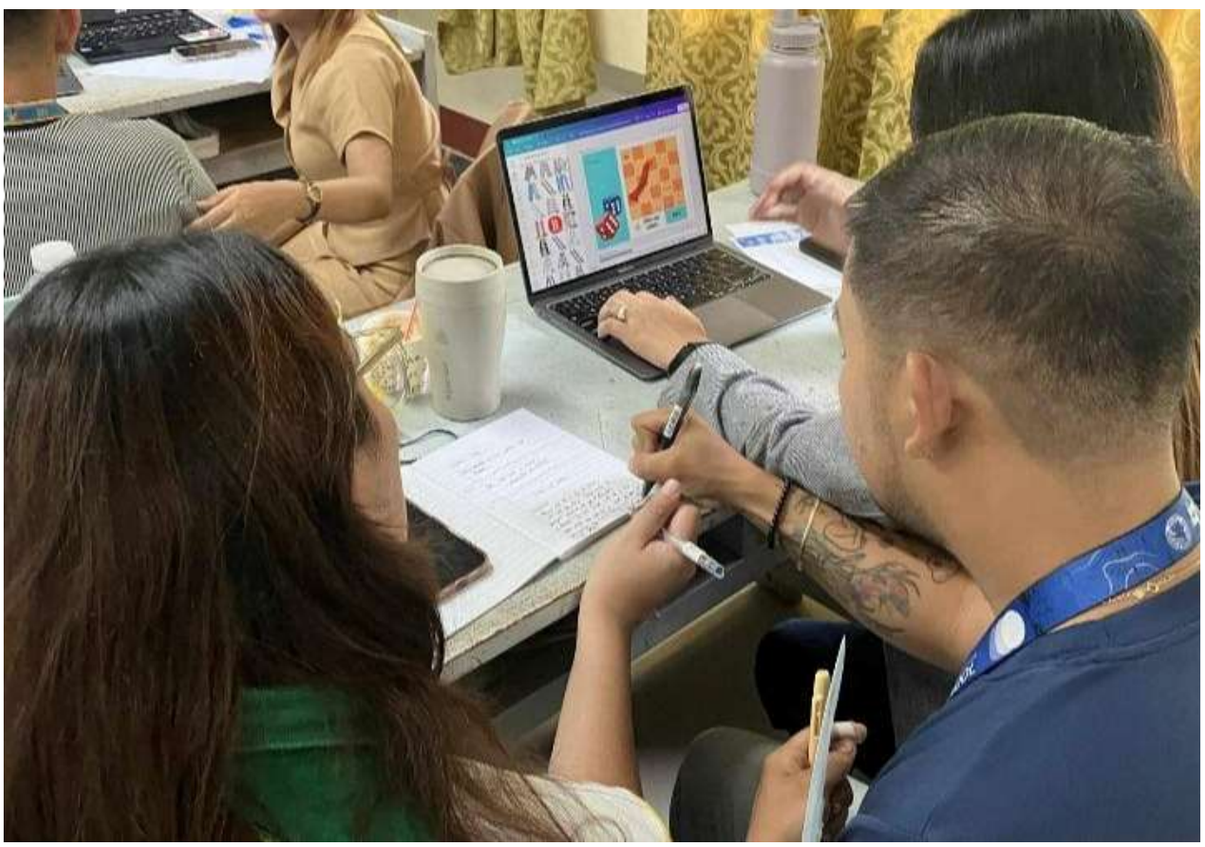
This serves as an invitation

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

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**	









IM Developed

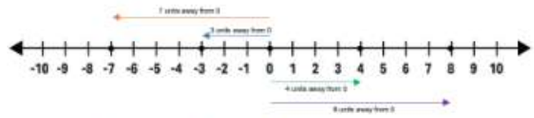
Absolute Value – How Far from Zero?

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. |−6|=___
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?

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Kabacan, Cotabato

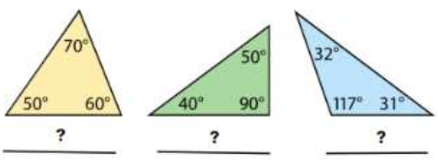
TRIANGLE TRIGONOMETRY SAMPLE WORKSHEET

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.

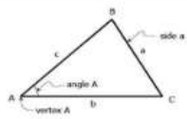


? ? ?

Activity 1: **Gotcha!**

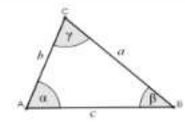
A. Fill in the missing by identifying the opposite side/s or opposite angle/s of the given triangle.

1.)



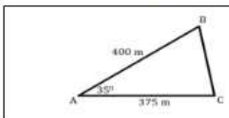
- side ___ is opposite angle 'A'.
- side b is opposite angle _____.
- side _____ is opposite angle 'C'.

2.)

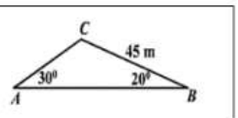


- side __ is opposite angle 'A".
- side b is opposite angle _____.
- side _____ is opposite angle _____.

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.

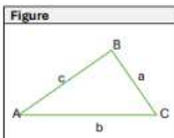


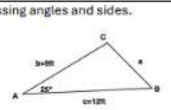
- no. of angle/s given: _____
- no. of side/s given: _____
- Law of _____



- 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:

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






6. Certificates

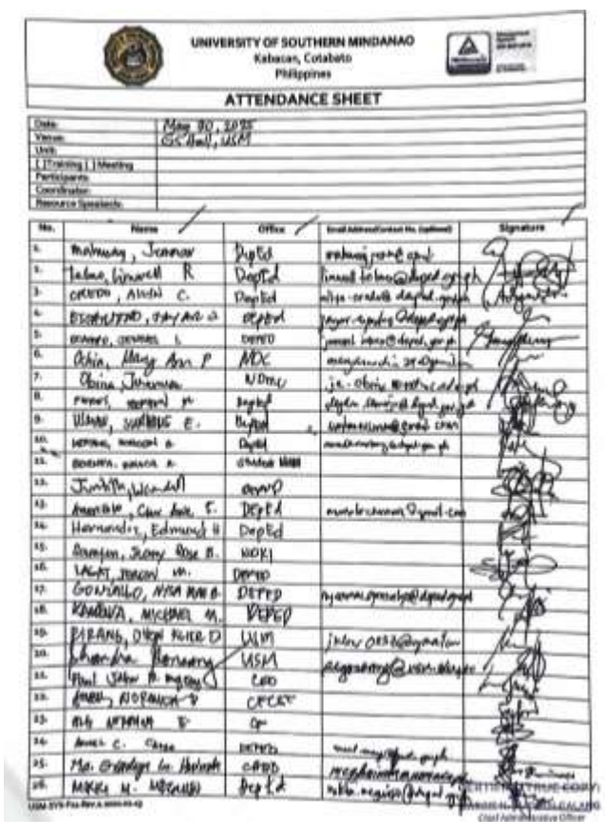


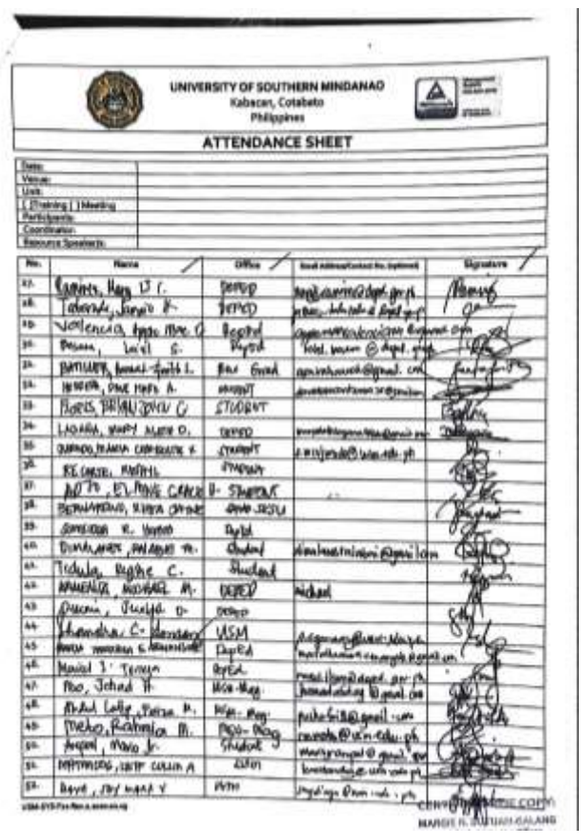






Attendance





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

7. Budget

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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			2,500			2,500			2,500.00			2,500	10,000
	B. Other General services	25,000.00									25,000.00				25,000
	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	12,203.60						12,203.60							12,204
	C. Office Supplies	5,096.40			5,096.40										5,096
	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. MAGBANUA, PhD
Director, ESO

Reviewed by:
SHEREEN MAE P. VILLARUZ
Budget Officer

Recommending Approval:
EIMER M. ESTILLOSO, EdD
VP for Administration & Finance

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

Approved By:
RODY P. GARCIA, MDM, JD, EdD
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)**		2,096.40	NP-53.5 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, film base type, UL 6m mm		-													
	HEAVYWEIGHT PAPER (10 pcs/pack)	10	2,000.00													
II.F	**Procurement of Training-related expenses**		12,203.60													
	Training Expenses	1	12,203.60													
II.H	**Procurement of Fuel, Oil, and Lubricants**		4,400.00	NP-53.14 Direct Retail Purchase of Petroleum Fuel, Oil and Lubricant (POL) Products and Airline Tickets												
	Gasoline	55	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.AI	**Payment of other general services**		25,000.00	Direct Contracting												
	Special Printing with lamination (for durable copies of activity sheets)	1	15,003.00													
	Pakyaw/JO	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:
0.00
Clerk/Staff

Certified Funds Available / Certified Appropriate Funds Available:
SHEREEN MAE P. VILLARUZ
Head, Budget Office

Approved by:
RODY P. GARCIA, MDM, JD, EdD
OIC-President

Certified by:
LEORENCE C. TANDOG
Department/College/Project Head

8. 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*	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*	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		

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
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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%	

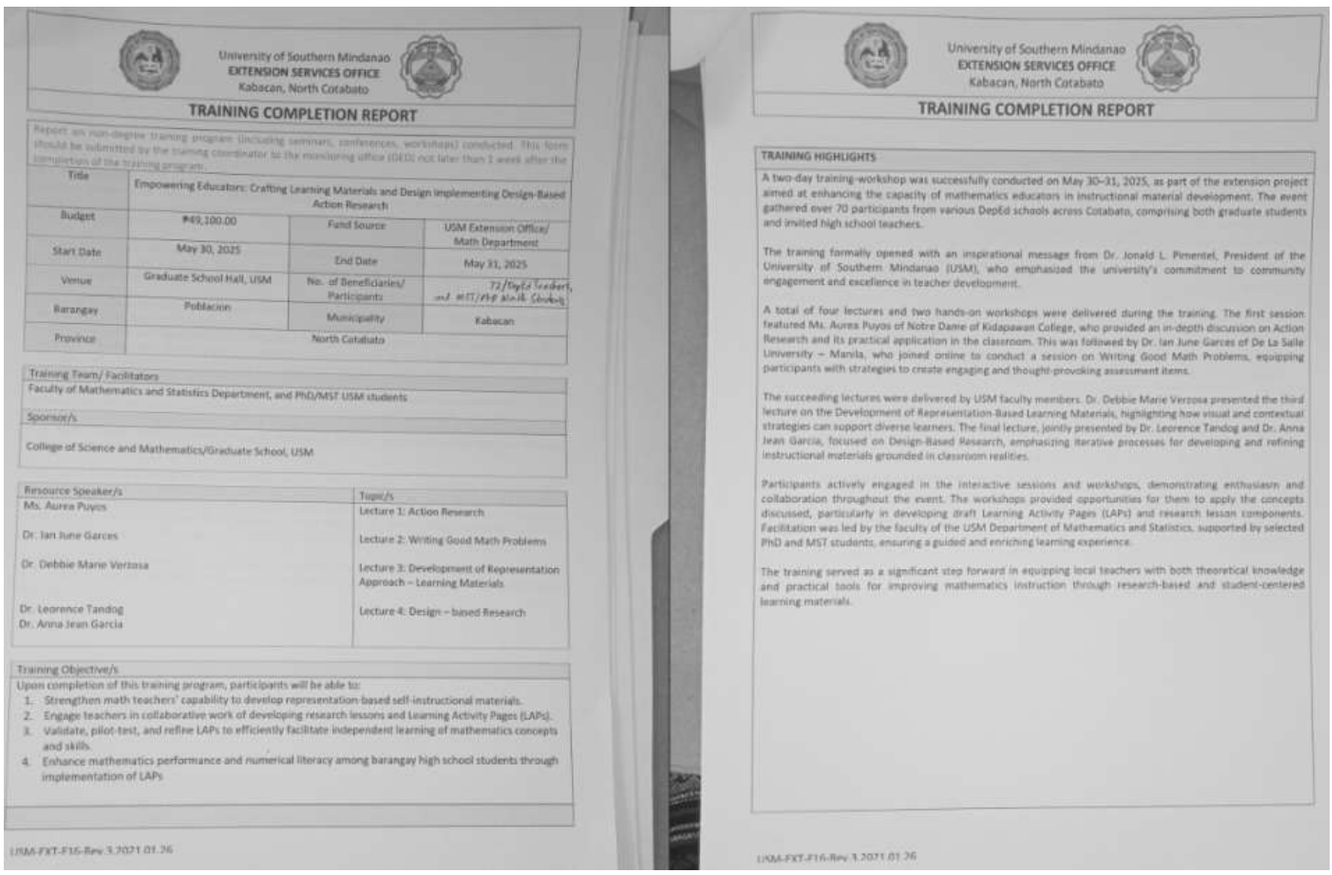
Prepared by:
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Noted by:
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College Extension Coordinator

Evaluated by:
GLYN G. MAGBANUA, PhD
Director, Extension Services Office

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

9. 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 (OEDI) 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/Math 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.

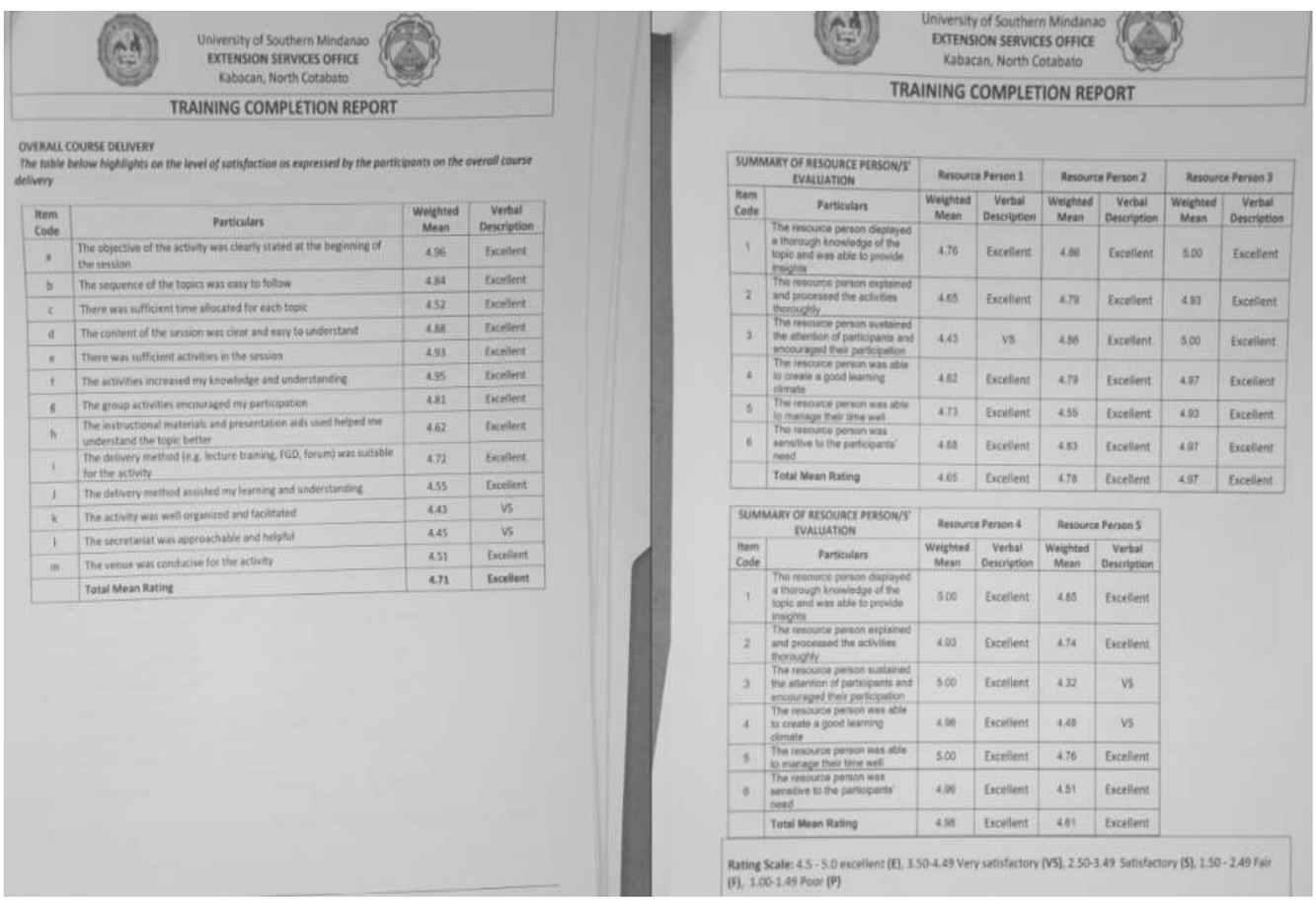
A total of four lectures and two hands-on workshops were delivered during the training. The first session featured Ms. Aurea Puyos of Notre Dame of Kidapawan College, who provided an in-depth discussion on Action Research and its practical application in the classroom. This was followed by Dr. Ian June 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



University of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

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 condusive for the activity	4.51	Excellent
	Total Mean Rating	**4.71**	**Excellent**

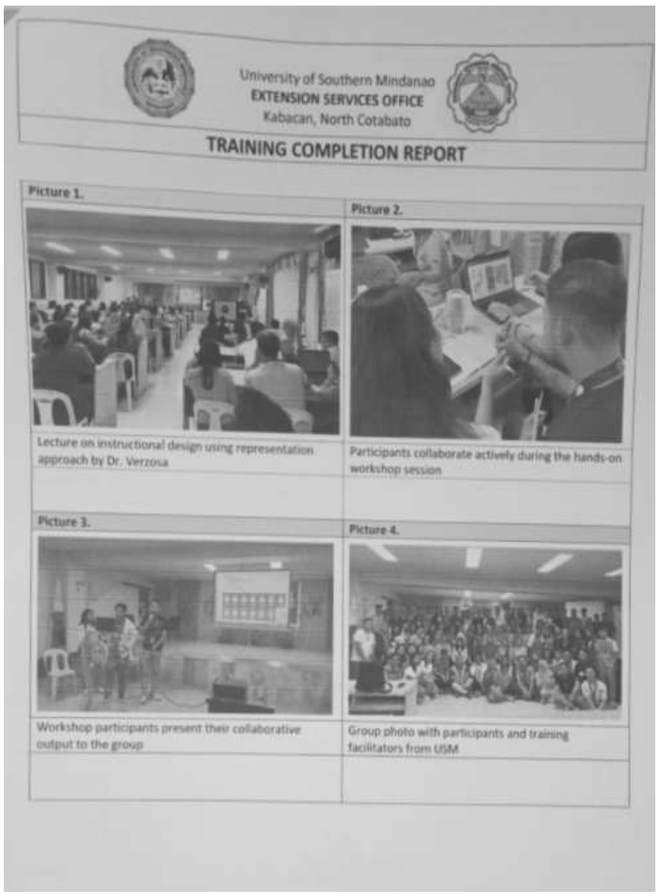
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Kabacan, North Cotabato

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	4.65	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)**



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TRAINING COMPLETION REPORT

Picture 1.

Lecture on instructional design using representation approach by Dr. Verzosa

Picture 2.

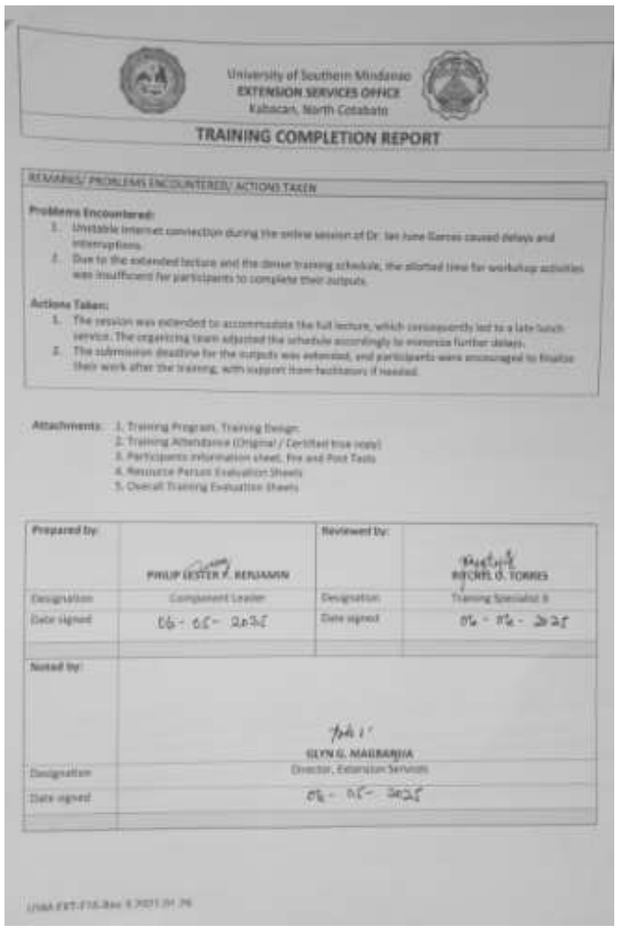
Participants collaborate actively during the hands-on workshop session

Picture 3.

Workshop participants present their collaborative output to the group

Picture 4.

Group photo with participants and training facilitators from USM



University of Southern Mindanao
EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

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:	RICHEL O. TORRES
Designation	Component Leader	Designation	Training Specialist II
Date signed	06-05-2025	Date signed	06-06-2025

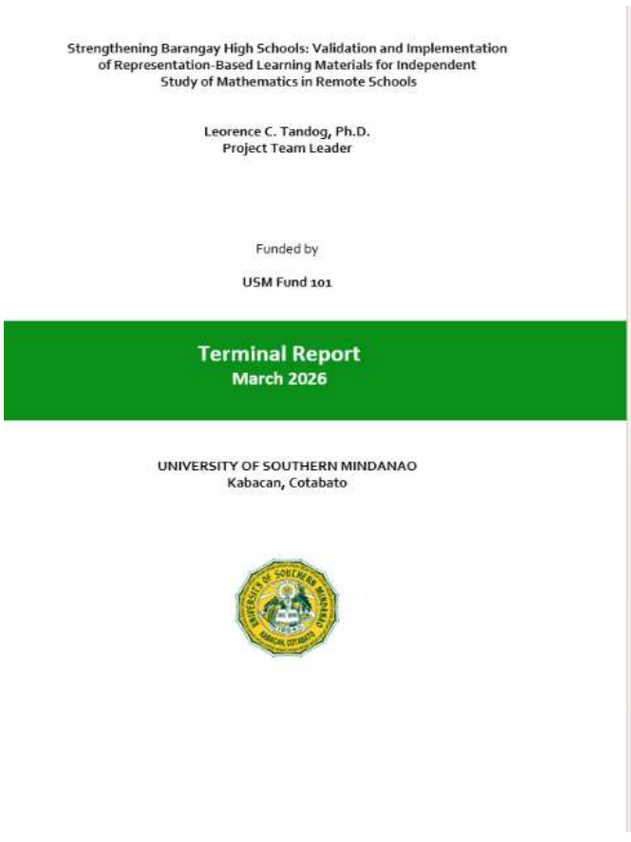
Noted by:

GLYN G. MAIRANIA
Director, Extension Services

Designation

Date signed 06-05-2025

10.Terminal Report



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

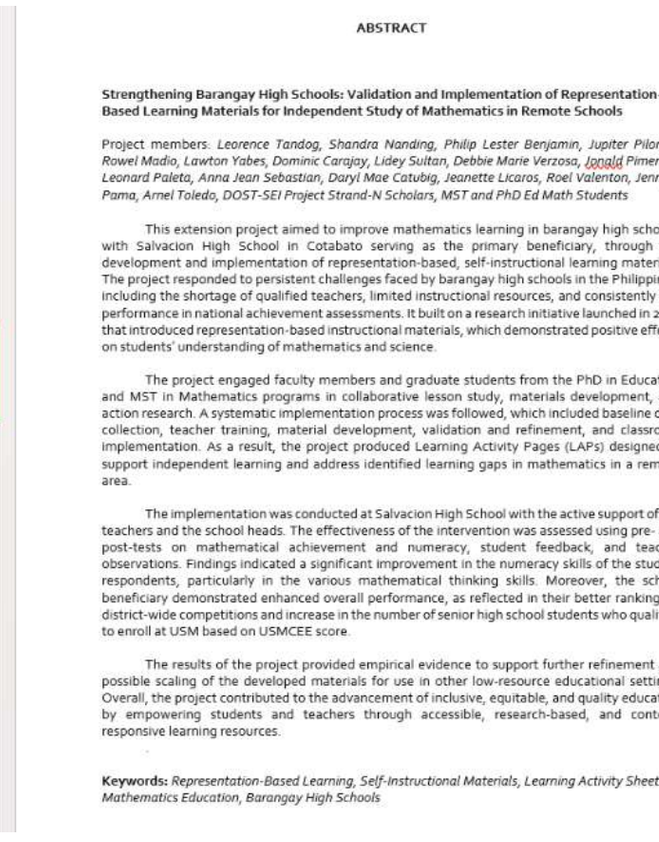
Leorence C. Tandog, Ph.D.
Project Team Leader

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*

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

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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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.



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

(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)

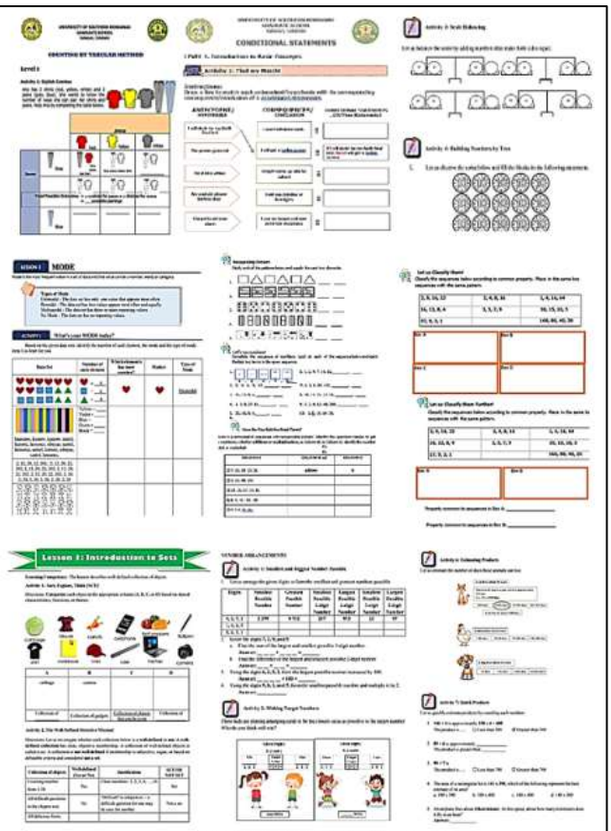


Figure 14. Samples of developed LMs

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.

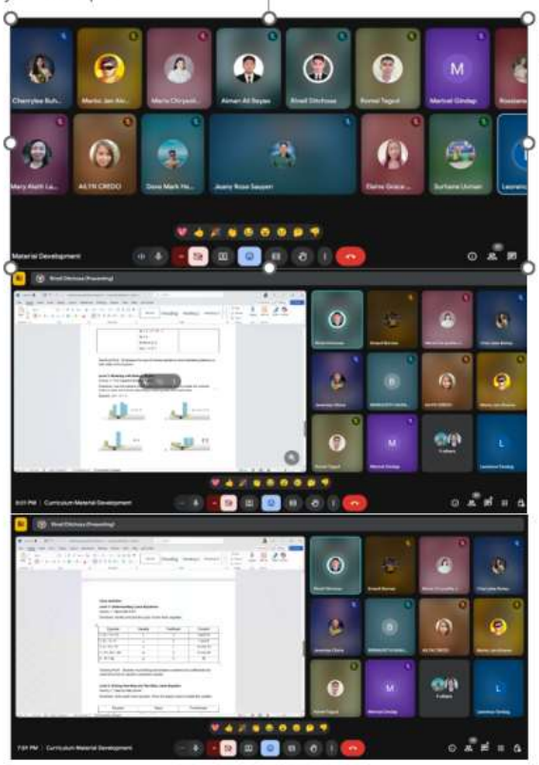


Figure 15. Online meetings and presentations of developed LMs

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.





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

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

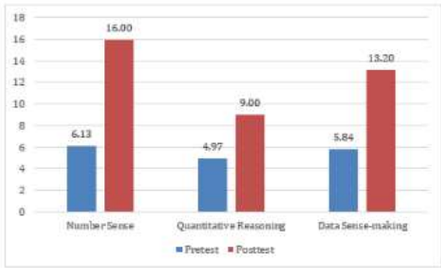


Figure 18. Pretest and Posttest performance of students

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			

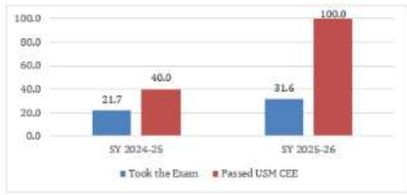


Figure 19. Comparative performance of Senior HS students in USMCEE

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

- Present manifestions that 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).
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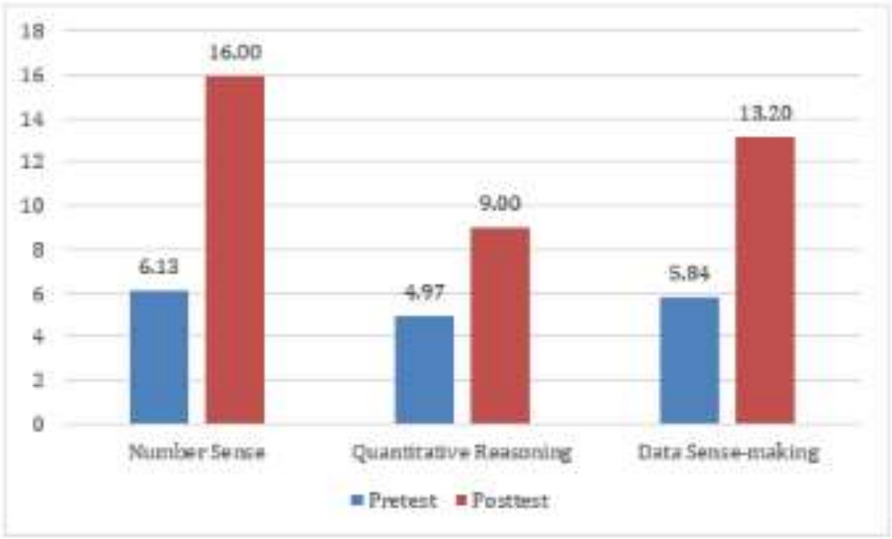


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Admitted to BS Program	2			
Admitted to Associate Program	1			



Figure 19. Comparative performance of Senior HS students in USMCEE

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



link: https://web.facebook.com/share/p/16JRz9gxMX5/

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**







https://web.facebook.com/share/1M9g1U1m3U/

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. CUTUAN-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 maiintindihan 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]TUAN-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

4. BEST PRACTICES

- Cite as many best practices as you can on Parameter B (Planning, Implementation, Monitoring and Evaluation).

❖ Planning

- ✓ Conducts baseline Rapid Mathematics Assessments (RMA), USMCEE readiness diagnostics, and teacher interviews at Salvacion High School and Nangaan Elementary School to pinpoint exact skill gaps such as Grade 2 - 4 performance baselines in Number Sense, before writing any learning materials.
- ✓ Secures official URDEC approval, Notices to Proceed (NTP), Special Orders from the Office of the President, and detailed Work and Financial Plans (WFP Fund 101 / Fund 05) prior to field deployment.
- ✓ Establishes signed Memoranda of Agreement (MOA) between USM (represented by President Dr. Jonald L. Pimentel) and DepEd Cotabato Division (represented by Superintendent Romelito G. Flores, CESO V) to formalize roles, facility access, and safety protocols.
- ✓ Holds regular minute-documented planning meetings to assign venue setups, audio-visual gear, and material printing tasks across the extension team.

❖ Implementation

- ✓ Combines the expertise of CSM Mathematics faculty, graduate students from the PhD Ed Math and MST Math programs, and undergrad students to design, critique, and deploy self-instructional Learning Activity Pages (LAPs).
- ✓ Develops representation-based worksheets and localized Maguindanaon Mother-Tongue story comics for primary math topics.
- ✓ Conducts two-day capacity-building workshops (such as the May 30–31, 2025 event at the USM Graduate School Hall) accredited with 8 PRC Continuing Professional Development (CPD) units for basic education teachers.
- ✓ Extends beyond basic training by offering Grade 12 USMCEE entrance exam review sessions and hands-on coaching for students participating in District DAMATH and Sudoku competitions.

❖ Monitoring and Evaluation

- ✓ Uses standard USM Extension Services Office (ESO) Quarterly Monitoring and Evaluation Reports to monitor target milestones, budget utilization, and field issues.
- ✓ Administers the standardized CHED Client Satisfaction Survey (CSS) to 50 teacher and student beneficiaries, achieving a Grand Mean score of 4.36 / 5.00 ("Excellent") and an official 87.2/100 ESO compliance rating.
- ✓ Evaluates student progress using comparative test data, recording average gains in Number Sense (6.13 to 16.00), Quantitative Reasoning (4.97 to 9.00), and Data Sense-Making (5.84 to 13.20).

PARAMETER C – FUNDING and OTHER RESOURCES

1. SYSTEM-INPUTS AND PROCESSES

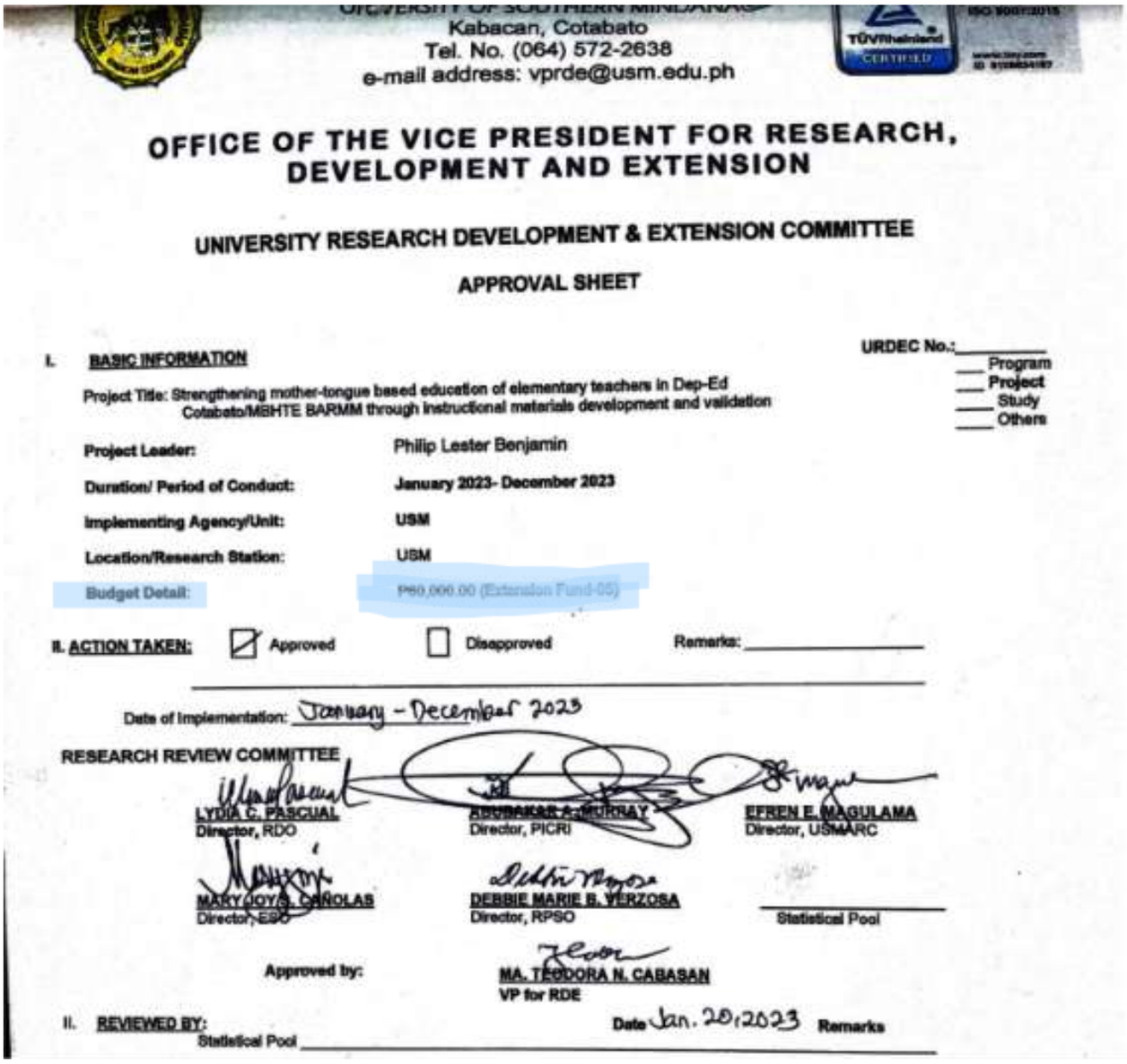
- Present the approved budget for Extension.

❖ 2024 – 2025 Budget Allocation

	Uploaded PPMP in https://dr	2024	2025
OVPRDE	Yes	518,189	632,541
RDO	Yes	647,573	790,476
USMARDC (overhead)	Yes	612,849	748,090
RPSO	Yes	392,568	479,198
IPTTBDO	Yes	213,600	260,736
Counterpart to SOX		280,000	320,000
R&D Display Center	Yes	117,770	143,759
Wildlife Center		133,473	162,927
RDE Personnel Devt Asst	Yes	117,770	143,759
In-house Review	Yes	706,622	862,556
Incentives (Publications and IP Assets)	Yes	866,233	1,057,389
USMARDC Support	Yes	1,028,085	1,254,958
Projects (RDO and ESO)		3,662,407	4,470,610
		9,297,139	11,327,000
		GAD	**566,350.00**

❖ 2026 – 2027 Budget Allocation

	ACTUAL in PPMP (2026)	2027
OVPRDE	590,000.00	500,000.00
RDO	790,000.00	790,000.00
USMARDC (overhead)	748,090.00	594,901.89
RPSO	370,000.00	294,234.36
IPTTBDO	260,736.00	240,000.00
Counterpart to SOX	320,000.00	254,472.96
R&D Display Center	190,784.62	0.00
Wildlife Center	162,927.00	162,927.00
SERDAC	156,000.00	
RDE Personnel Devt Asst	200,743.70	143,193.25
In-house Review	800,000.00	500,000.00
Incentives (Publications and IP Assets)	1,150,000.00	914,512.21
PICRI	1,280,000.00	1,017,891.85
USMARDC Support	1,254,958.00	997,977.83
Projects (RDO, USMARDC, ESO, PICRI)	4,466,760.62	3,720,253.96
	12,741,000	10,132,000
	0.00	10,497,030.17



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

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

I. **BASIC INFORMATION**

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 S. CAÑOLAS
Director, ESO

DEBBIE MARIE B. VERZOSA
Director, RPSO

Statistical Pool

Approved by:

MA. TEODORA N. CABASAN
VP for RDE

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

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

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

Management System ISO 9001:2015

OFFICE OF THE VICE PRESIDENT FOR RESEARCH, DEVELOPMENT AND EXTENSION

UNIVERSITY RESEARCH DEVELOPMENT & EXTENSION COMMITTEE

APPROVAL SHEET

I. **BASIC INFORMATION**

URDEC No.: _____

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

___ Program
_x_ Project
___ Study
___ Others

Author(s): Leorence C. Tandog

Duration/ Period of Conduct: January 2025 – December 2025

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

JALALODEN B. MAROHOM
IPTTBDO Director

JURHAMID C. IMLAN
USMARC Director

GLYN G. MAGBANUA
Extension Director

MA. TEODORA N. CABASAN
Publication Director

Statistical Pool

REPUBLIC OF THE PHILIPPINES
UNIVERSITY OF SOUTHERN MINDAN

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			2,500			2,500			2,500.00			2,500	10,000
	B. Other General services	25,000.00									25,000.00				25,000
	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	12,203.60						12,203.60							12,204
	C. Office Supplies	5,096.40			5,096.40										5,096
	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. MAGBANUA, PhD
Director, ESO

Reviewed by:
SHEREEN MAE P. VILLARUZ
Budget Officer

Recommending Approval:
EIMER M. ESTILLOSO, EdD
VP for Administration & Finance

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

Approved By:
RODY P. GARCIA, MDM, JD, FAP
OIC, President

- Show (pictorial with captions) facilities and equipment for the Extension Program



Figure 1. *Main ICTC Building managing and maintaining the university's network infrastructure and internet connection for extension operations.*



Figure 2. *Wall-mounted network enclosures and access points installed across academic units to provide continuous internet access for extension work.*



Figure 3. *University FM radio station facility used to broadcast educational content and updates to community beneficiaries.*



Figure 4. *Desktop computer unit and color printer assigned to the Extension Coordinator for project administration and document production.*



Figure 5. *Portable DLP projector utilized by the extension team for capability-building activities and off-campus presentations*



Figure 6. *Ink sets and bulk office supplies allocated for printing and reproducing Learning Materials*







Figure 7. *ESO Training Center / Conference Room*

- Present institutional policies on deloading/equivalent teaching load for Extension.

2.1.b. Research Workload Equivalence

Faculty Researcher

A faculty member designated to undertake officially approved research, development and extension, or resource generation activities without honorarium, shall be entitled to the

following workload-credits or teaching assignments equivalent, provided that where a faculty member is designated to undertake more than one research, extension, or resource generation activities at the same time, in one given period, the workload-credits to be granted shall not exceed a total of nine (9) units.

One (1) program (with at least 2 projects)	9 units
One (1) project (with at least 2 studies)	6 units
One (1) study	3 units

Full-time RDE Personnel

Full-time RDE personnel with Salary Grade (SG) 11 and above should have at least 18 units of load, divided as follows.

Functions	Units		
	SG11/12 e.g., Science Research Specialist 1 / Education Program Specialist 1	**SG15/16** e.g, Education Program Specialist 2 / Science Research Specialist 2 / Training Specialist 2	**SG 18 and above** e.g., Senior Science Research Specialist
RDE Programs/Project/ Study (*without honorarium*)	9	12	15
Unit Assignment/ Special Designation	9	6	3

For full-time RDE personnel, the unit workloads for various project roles are defined as follows.

Full-Time RDE personnel as Program/ Project/Study Leader	**Units**
a. Program Leader (with 1 project leader, 1 research assistant, 1 laborer)	
2 projects	8 units
3 or more projects	10 units
b. Project Leader (with 1 study leader, 1 research assistant, 1 laborer)	
2 studies	6 units
3 or more studies	8 units
c. Project Leader (2 or more studies) with 1 research assistant and/or laborer	6 units

Full-Time RDE personnel as Program/ Project/Study Leader	**Units**
d. Project Leader (2 or more studies) with no research assistant and no laborer	8 units

Faculty with research or laboratory designation	**Units**
a. Study Leader with no honorarium (with 1 Research staff and 1 Laborer)	3 units
b. Lab In-charge	6 units

Note: All honoraria and/or load displacements are subject to approval and availability of funds.

Honorarium/Stipend/Productivity Incentive for Locally Funded Project

1. A researcher or faculty shall only be entitled to an honorarium for tasks beyond his/her normal workload.

2. For university-funded RDE projects (local research fund), the maximum monthly honorarium shall be as follows, subject to the approved budget:

   Project Leader - Php 4,000.00/project /
   Study Leader - Php 3,000.00/study

3. The honorarium shall be released on a quarterly basis. Honorarium can only be released upon submission of approved workplan, Special Order, budget summary, and quarterly monitoring and evaluation report (Appendix 1a for Research, and Appendix 1b for Extension).

4. The last quarter of the honoraria for all internally and externally funded research can only be released upon submission of an accomplishment/terminal report (Appendix 2a and 2b for research and extension, respectively) and publishable article (Appendix 3, accepted and certified by the RPSO Director) in a refereed journal. For extension, the publishable article may be in the form of a journal article or news feature article.

5. For externally funded RDE projects, the rate of the honorarium shall depend on the approved allocation of the funding institutions.

2. IMPLEMENTATION

- Present the budgetary allocation for the Academic Unit's Extension Program in the last 3-5 years

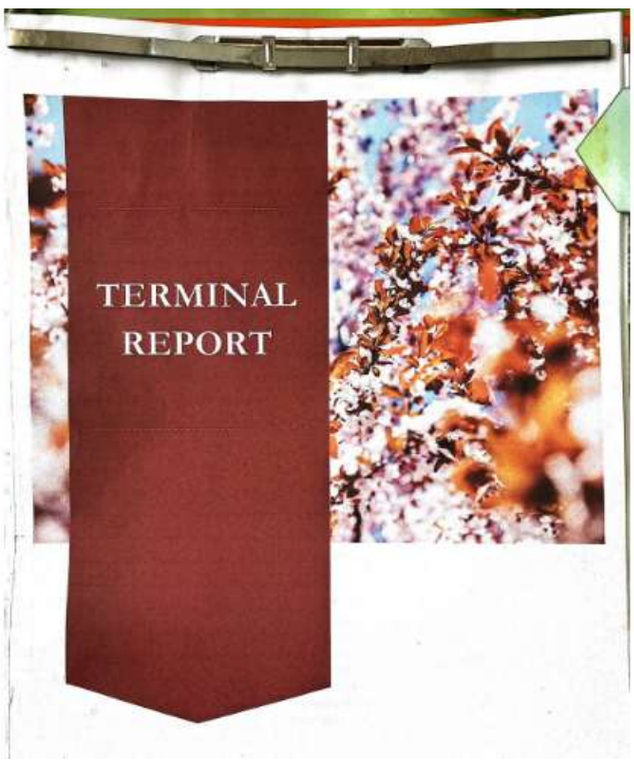
Item	Amount				
	CY 2022	CY 2023	CY 2024	CY 2025	CY 2026
1. Capability building	N/A	₱0.00	N/A	₱12,203.60	₱6,000.00
2. Supplies and Materials		₱20,188.14		₱5,096.40	₱4,500.00
3. Travel and Fuel Costs		₱6,750.00		₱4,400.00	₱4,000.00
4. Acquisition of Equipoment		₱0.00		₱0.00	₱0.00
5. Repair of Facilities		₱0.00		₱0.00	₱0.00
6. Communication/Dissemination		₱3,000.00		₱3,300.00	₱3,000.00
7. Others		₱30,000.00		₱35,000.00	₱7,500.00
TOTAL	N/A	₱59,938.14	N/A	₱60,000.00	₱25,000.00

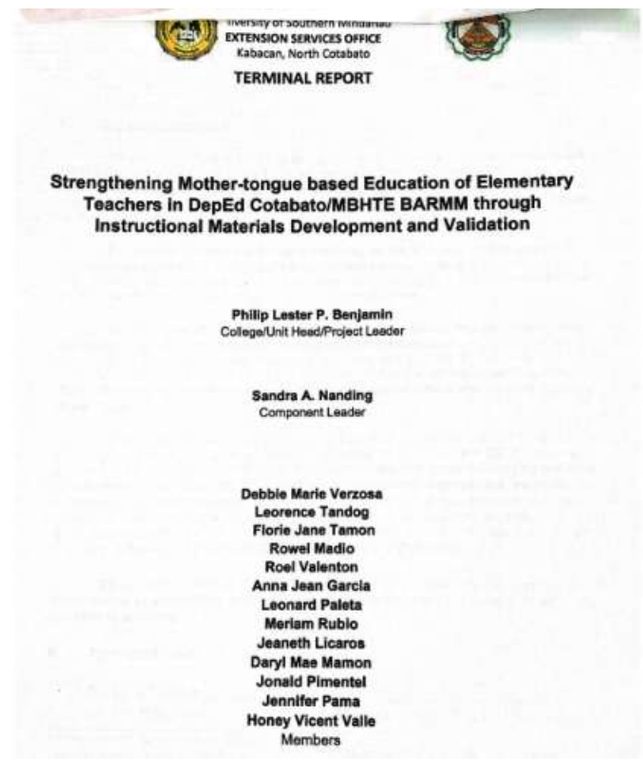
- State the list of Extension Linkages

Agency or Institution	Address	Level (int'l, Nat'l, Reg'l, Local)	Nature of Assistance/Linkage
1. Salvacion High School	Matalam, Cotabato	Local	Partner school beneficiary for the implementation of representation-based Learning Activity Pages (LAPs) in Mathematics, entrance examination reviews, and student coaching
2. Nangaan Elementary School	Nangaan, Kabacan, Cotabato	Local	Partner school beneficiary for instructional material developed
3. Department of Education - Cotabato	Amas, Kidapawan City, Cotabato	Local/Regional	Partner educational authority facilitating teacher capacity-building

3. OUTCOMES

- Present manifestations that the Extension Program is adequately funded.




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%

EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

TERMINAL REPORT

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

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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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EXTENSION SERVICES OFFICE
Kabacan, North Cotabato

TERMINAL REPORT

IX. Pictorials



Inception Meeting with Teachers of Nangaan Elementary School



USM-EXT-F15-Rev.3.2021.01.26





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*

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

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

(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)

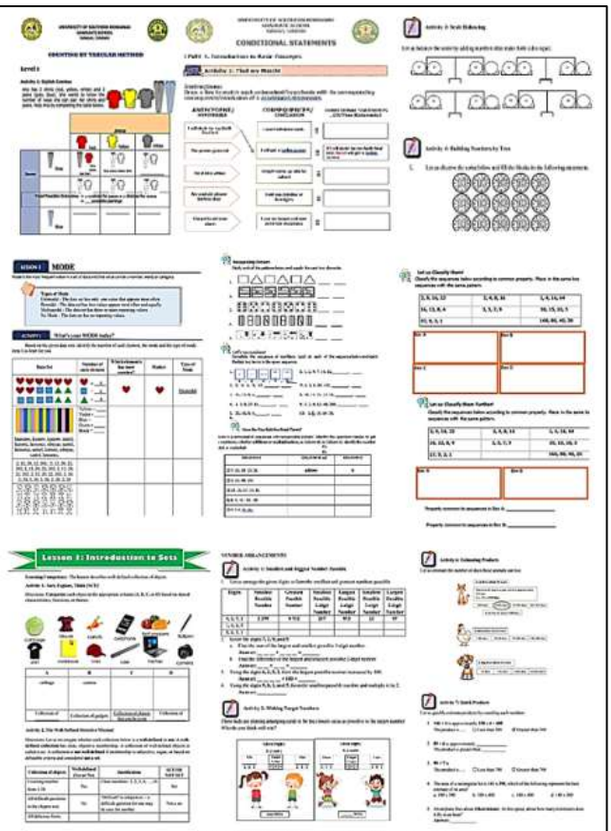


Figure 14. Samples of developed LMs

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.

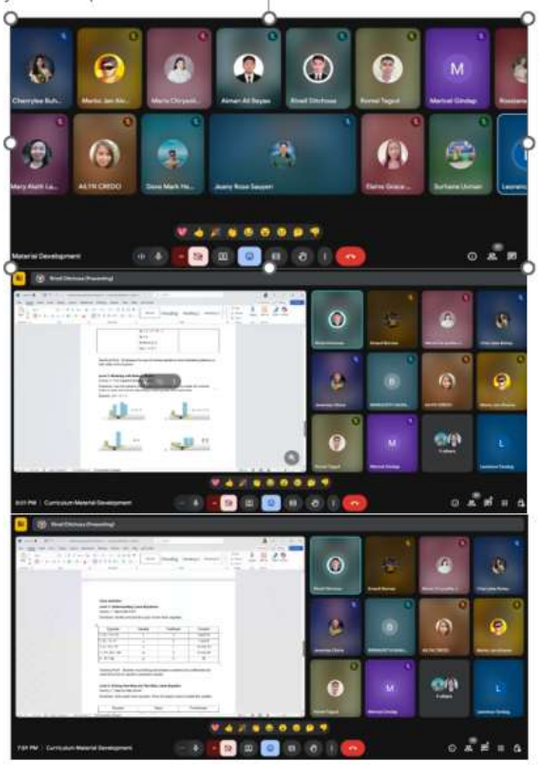


Figure 15. Online meetings and presentations of developed LMs

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.





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

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

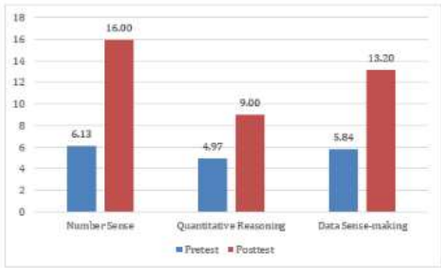


Figure 18. Pretest and Posttest performance of students

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			

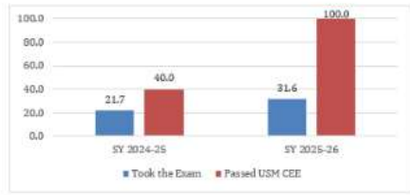


Figure 19. Comparative performance of Senior HS students in USMCEE

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**		**(%) 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: 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

4. BEST PRACTICES

- Cite as many best practices as you can on Parameter C (Funding and Other Resources).

❖ **Institutional Budget Allocation and Financial Sustainability**

- ✓ Institutional extension programs are supported by dedicated internal funding streams (such as Extension Fund 05 and Fund 101).
- ✓ Systematic institutional budget expansion is evident across university research and extension support units (e.g., funding for project grants through ESO and RDO grew from ₱3.66M in 2024 to ₱4.47M in 2025, and reached ₱12.74M in total RDE allocations for 2026).
- ✓ Projects strictly align expenditures with approved Project Procurement Management Plans (PPMP), Line-Item Budgets (LIB), and Special Budgets prior to implementation.

❖ **Timely Fund Execution and High Utilization**

- ✓ Extension projects consistently achieve 100% budget utilization rates across all quarters as verified through official Quarterly Monitoring and Evaluation Reports and Terminal Financial Reports.
- ✓ Expenditure focuses heavily on core delivery requirements, such as capability building/training expenses, customized learning material production, fuel/travel for field deployment, and mobile communication allowances

❖ **Institutionalization of Faculty Incentives and Deloading**

- ✓ Project Leaders, Component Leaders, and technical specialists (e.g., instructional material illustrators) receive allocated monthly or quarterly honoraria built into the project budget.
- ✓ Faculty involved in extension receive equivalent workload credits (up to 9 units for RDE programs/projects) or official deloading through formal Special Orders (SO) and Notices to Proceed (NTP).

❖ **Technical Resource Integration and External Collaboration**

- ✓ Projects leverage external expert inputs (e.g., guest plenary speakers from leading universities like Ateneo de Manila University) to enhance capacity-building activities without relying on additional external project funding.
- ✓ Higher-degree students (PhD and MST Mathematics candidates) and faculty collaborate within Professional Learning Communities (PLCs) to co-develop, validate, and deploy research-based instructional materials (such as Learning Activity Pages and Math Zines).

❖ **Optimized Provision of Physical and ICT Infrastructure**

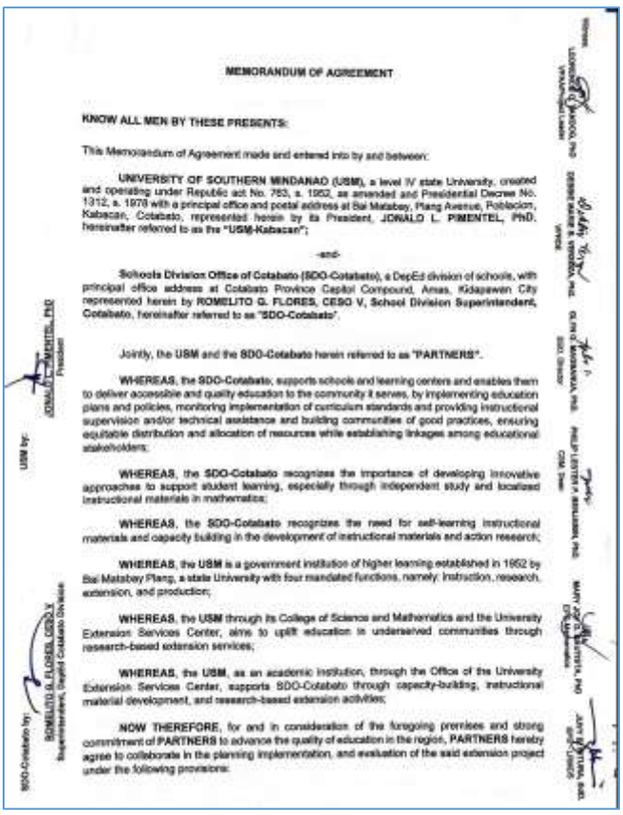
- ✓ Project teams are provided dedicated ICT facilities, server rooms, internet access managed by the Information, Communication and Technology Center (ICTC), and specialized extension equipment (laptops, printers, Digital Light Processors/projectors).
- ✓ The Extension Services Office (ESO) maintains specialized workplaces, including an ESO Director's Office, a dedicated Conference/TC Room for monthly coordination meetings, and unit-level administrative staff.
- ✓ Utilization of institutional broadcast facilities (such as DXVL FM station) to extend reach and share project outcomes with broader community beneficiaries.

PARAMETER D – COMMUNITY INVOLVEMENT and PARTICIPATION

1. SYSTEM-INPUTS AND PROCESSES

- Present strategies in the involvement of community, government and private agencies in the Extension Program.

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 Bal Malabey, 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 1962 by Bal Malabey 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;

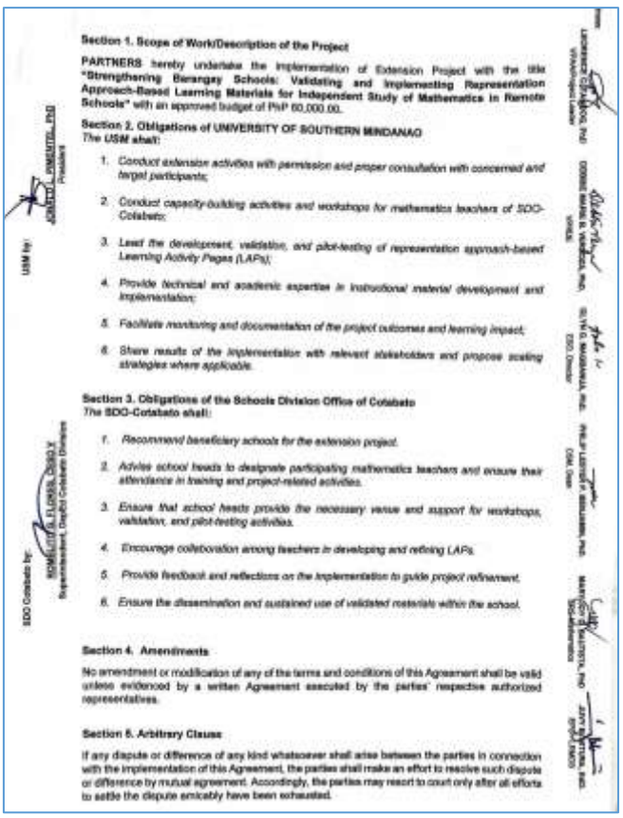
NOW THEREFORE, for and in consideration of the foregoing premises and strong commitment of **PARTNERS** to advance the quality of education in the region, **PARTNERS** hereby agree to collaborate in the planning implementation, and evaluation of the said extension project under the following provisions:

USM by:

JONALD L. PIMENTEL, PhD
President

SDO-Cotabato by:

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



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

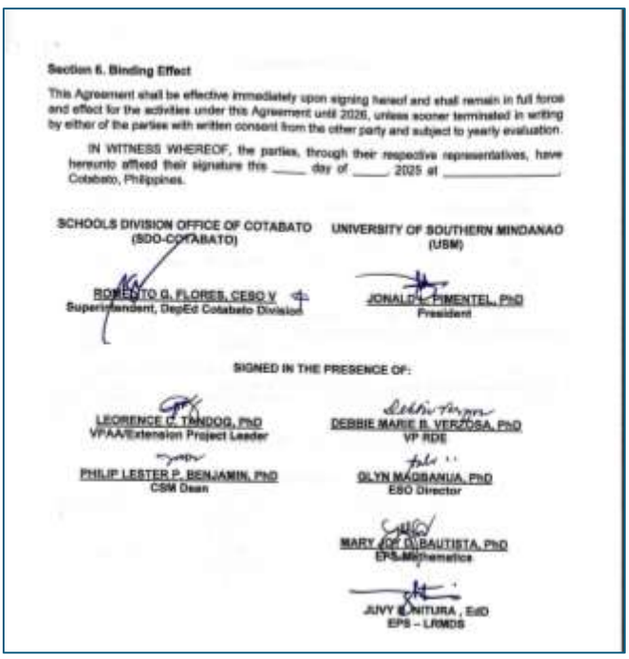
If any dispute or difference of any kind whatsoever shall arise between the parties in connection with the implementation of this Agreement, the parties shall make an effort to resolve such dispute or difference by mutual agreement. Accordingly, the parties may resort to court only after all efforts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



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 G. 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 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 Acknowledgment 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. 94;
Page No. 20;
Book No. 144;
Series of 2025.

REGERICK L. BENITO
NOTARY Public for the Province of Cotabato
Until 31st December 31, 2026
Notarial Commission No. 31, 2025
PTR No. 0270823-01-01-25 Amas, Kidapawan City
IBP O.R No. 502756-(1)-08-12 North Cotabato Chapter
Roll No. 46786

RDE Agenda

1.3 RDE Agenda (BOR Resolution No. 69, series 2021)

In support to the national agenda and in consultations with stakeholders, the RDE themes are as follows:

RDE Themes	RDE Priority Areas
Quality Learning, Skills Development, and Literacy	Innovative teaching strategies; development and evaluation of functional education materials and modalities, and teaching strategies/approaches, motivation, and engagement; school climate; school and knowledge management; special education; remedial education; curriculum development and implementation; alternative learning system; assessment studies; soft skills; practical skills; adult education; language literacy; numerical literacy; data literacy; computer literacy; international studies; tracer studies; livelihood programs;; capacity building; capability building
Social Development, and Strong Institutions	Gender and development GAD; peace initiatives; community development; human security; justice; public policy and legislations; social rehabilitation; governance; organizational studies; behavioral studies; social institutions; ethics and public accountability; programs/project assessment; community needs assessment and interventions; partnerships and linkages; technology adoption; Institutional development; upgrading of laboratory and lecture facilities
Preservation of Culture	Multicultural studies; educational materials for IPs; indigenous knowledge systems and practices; development of materials for cultural knowledge and promotion; arts; language and literature studies; traditional dance, sports and music; halal studies
Environmental Protection, Conservation, and Risk Reduction	Environment rehabilitation studies; biodiversity; climate change adaptation; risk, hazard and mitigation; biosafety; natural resources conservation and management; bioremediation; flood control; waste management; ecological preservation and care; environmental impact assessment; tourism; agroecology; natural farming
Food Security and Poverty Reduction	Agricultural and fisheries research; biotechnology; innovations; quality food product development; technology development; halal food production; sustainable production; responsible consumption; organic agriculture; food testing; smart agriculture; precision farming; farm machineries; post-harvest facilities; vertical farming; indigenous food; food tourism; development of new breeds and varieties

RDE Themes	RDE Priority Areas
Good Health and Wellbeing	Nutrition; nutraceuticals; sports, physical education; physical fitness; sports psychology; health resiliency; psycho-social health; medical and medicinal studies; hygiene and sanitation; functional foods; food and water quality and safety; mental and emotional health; therapy; coping mechanism; preventive measures; emerging diseases; health management; traditional and alternative medicine; community health; risk assessment and mitigation; health informatics, regenerative medicine, emergency response medicine
Innovations in Science, Engineering, and Technology	Innovations and futures thinking; product and technology development; energy; materials science; nanotechnologies; robotics; artificial intelligence; internet of things; Science, Engineering, Communication, and Technologies (SECT) 4.0; biotechnology and OMIC technologies; inventions and discoveries; basic research; information technologies; electronics; drug discovery; mathematics; emerging technologies; fabrication; transport system; waste management; infrastructure; water systems; simulation studies; industrial and allied technology, Data Science and Analytics, GIS, Remote sensing, machine learning; quantum technology; smart cities
Sustainable Entrepreneurship and Management	Economics; micro and macro scale business; product development; marketing; commercialization; networking; franchising; financial management; business feasibility studies; risk and opportunities; value adding; value chain analysis; organizational management; quality service assessment; human resource management; production management; sustainable cooperative studies; Entrepreneurial studies







Inception meeting with Principal and Teachers of Nangaan Elementary School



Courtesy meeting with the new principal of Salvacion High School.

UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Philippines

INVITATION LETTER

April 22, 2025

DR. IAN JUNE L. GARCES
Associate Professor, Department of Mathematics
Ateneo De Manila University
Loyola Heights, Metro Manila

Dear Dr. Ian June L. Garces,

Greetings!

On behalf of University of Southern Mindanao, we are pleased to extend our warm invitation to you as one of the speakers for our upcoming seminar-workshop titled: **"Empowering Educators: Crafting Learning Materials and Implementing Design-Based Action Research"**

The event will be held on May 30-31, 2025 at Graduate School, University of Southern Mindanao, Kabacan, Cotabato.

This event aims to bring together educators and researchers to strengthen their capabilities in developing instructional materials and conducting action research in real classroom settings.

This two-day seminar is designed to:

1. Equip participants with the skills to create instructional materials using multiple representations for better student engagement and learning outcomes;
2. Guide them in formulating meaningful and challenging mathematics problems that foster critical thinking; and
3. Assist them in identifying and refining relevant research questions for classroom-based inquiry.

We believe your expertise in Writing Good Math Problems would greatly inspire and benefit our participants. Your insights would be invaluable in enriching discussions and helping educators gain practical tools for enhancing their teaching practices. Should you accept this invitation, we would be happy to coordinate the details of your talk at your convenience. We can also provide any necessary support in terms of logistics or presentation needs.

Thank you for considering this invitation. We hope to have the privilege of welcoming you as one of our esteemed speakers.

Warm regards,

PHILIP LESTER P. BENJAMIN, PhD
Conference Chair
Email: plbenj@usm.edu.ph
Contact number: 09338245352

2. IMPLEMENTATION

- Describe community participation in the planning, implementation , monitoring and evaluation, fund-sourcing and technology/knowledge utilizations.

Community involvement begins with initial collaborative meetings, diagnostic assessments, and field visits involving local government unit leaders, school principals, and teachers. During inception meetings at partner schools (such as Nangaan Elementary School and Salvacion High School), community stakeholders identify specific learning gaps in mathematics, express local classroom needs, and directly help select schedule dates, target topics, and workshop logistics.

Beneficiaries participate actively through multi-tiered engagement. Local public school teachers attend capacity-building training-workshops to co-design and validate instructional materials. During weekly Friday classroom deployments, teachers and school heads co-facilitate learning sessions, assist student volunteers, and help deploy Learning Activity Pages (LAPs) and Zines directly to students.

Target beneficiaries participate in regular feedback collection and progress assessment activities. Teachers and school heads complete resource person and overall training evaluation sheets after workshops to assess activity relevance. Furthermore, community members participate in quarterly project monitoring visits conducted by the Extension Services Office, complete satisfaction survey questionnaires, and sit for diagnostic post-tests to track student achievement gains.

The community actively contributes essential non-monetary and logistical resources. Partner schools and local communities provide physical venues, administrative support, local transportation, and meal coordination during field activities. This complements the formal financial backing established through the institutional Memorandum of Agreement (MOA) and project budget allocations.

Community participants adopt and integrate the skills and tools provided during the program into their local settings. Local educators directly apply teaching frameworks such as the Multiple Representation Approach (MRA), Zine creation, and Action Research, to craft their own localized classroom learning materials. Students apply acquired numerical literacy skills to improve standard academic performance and excel in district and municipal mathematics competitions.

- Name all activities to show that there is community participation and involvement in extension activities.

1. Inception Meetings and Baseline Field Visits

   Courtesy calls, orientation sessions, and initial consultation meetings conducted with barangay officials, school heads, and teachers at partner schools (such as Nangaan Elementary School and Salvacion High School) to formally introduce project goals and establish local cooperation.

2. Needs Assessment & Diagnostic Assessments

   Ocular site visits, teacher interviews, and the administration of diagnostic pre-test including the Rapid Mathematics Assessment, to evaluate existing resources and identify specific mathematical skill gaps among students.

3. Capacity-Building Training-Workshops

    a. Training-Workshop on Instructional Materials Development (April 23, 2024).

    b. Empowering Educators: Crafting Learning Materials and Implementing Design-Based Action Research (May 30–31, 2025).

    c. Zines as Alternative Pathways to Numeracy and Literacy: A Representation-Based Approach to Independent Learning (November 2, 2025)

4. Co-Design and Material Creation

    Hands-on workshop sessions where local public school teachers collaborated with university implementers to design, refine, and validate contextualized Learning Activity Pages.

5. Weekly Classroom Material Deployment

    Regular Friday implementation visits where teachers, school heads, and university team members co-facilitated independent learning activities and monitored student progress using the developed LAPs.

6. Student Academic Coaching & College Prep

    Review sessions for senior high school students preparing for the University of Southern Mindanao College Entrance Examination (USMCEE) and specialized coaching for students participating in District and Municipal DAMATH and Mathematics Olympics competitions.

- Describe the Program’s commitment to the service of the community

The program directly targets critical educational challenges faced by remote barangay high schools, including severe shortages of specialized mathematics teachers, a lack of standardized textbooks, and low student performance on national assessments.

Rather than offering temporary relief, the program builds long-term local capacity by training public school teachers to create their own representation-based instructional materials and conduct classroom action research.

The university secures official PRC CPD accreditation for its workshops, granting professional development credit units to local educators to enhance their teaching credentials and career progression.

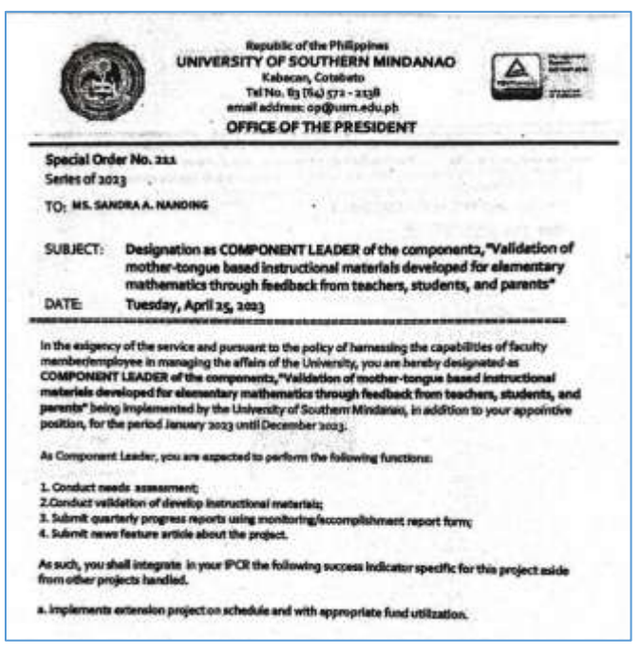
The program adapts instructional materials to align with the students' local background, native language, and specific learning preferences, ensuring inclusive and equitable education.

By offering college entrance exam (USMCEE) review sessions, the program increases rural students' admission rates into higher education, opening pathways for socio-economic advancement in underserved communities.

- Show evidences that the College/Academic Unit is committed to the service and development of the community.

Year	Project Title	Project Implementor/s	Beneficiary / Site	Status
2023	Strengthening mother-tongue based education of elementary teachers in DepEd Cotabato/MBHTE BARMM through instructional materials development and validation	Project Leader: Philip Lester Benjamin Component Leader: Sandra Nanding	Nangaan Elementary School, DepEd Cotabato	Completed
2025	Strengthening Barangay High Schools: Validation and Implementation of Representation-Based Learning Materials for Independent Study of Mathematics in Remote Schools	Project Leader: Leorence Tandog Component Leaders: Philip Lester Benjamin Debbie Marie Verzosa Leonard Paleta Jupiter Pilongo	Salvacion High School, Matalam, Cotabato	Completed
2026	Strengthening Barangay Schools (Phase 2): Sustaining Mathematics Learning through Teacher Mentoring and Weekly Student Learning Support	Project Leader: Sandra Nanding Component Leaders: Philip Lester Benjamin Leorence Tandog	Rubio Elementary School and Salvacion High School, Matalam, Cotabato	On going
2027	BlOnihan Para sa Karunungan in Columbio: Strengthening Pedagogical Excellence through Model Lesson Plans and Contextualized Learning Resources for Mathematics	Project Leader: Sandra Nanding Component Leaders: Philip Lester Benjamin Jead Macalisang	Schools in Columbio, Sultan Kudarat	Approved

Special Orders



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 componenta, "Validation of mother-tongue based instructional materials developed for elementary mathematics through feedback from teachers, students, and parents"

DATE: Tuesday, April 25, 2023

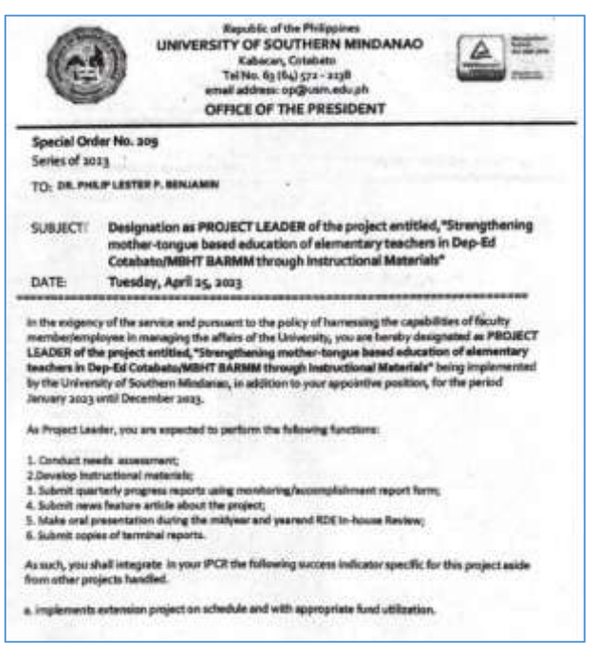
In the exigency of the service and pursuant to the policy of harnessing the capabilities of faculty member/employee in managing the affairs of the University, you are hereby designated as COMPONENT LEADER of the components, "Validation of mother-tongue based instructional materials developed for elementary 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.



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

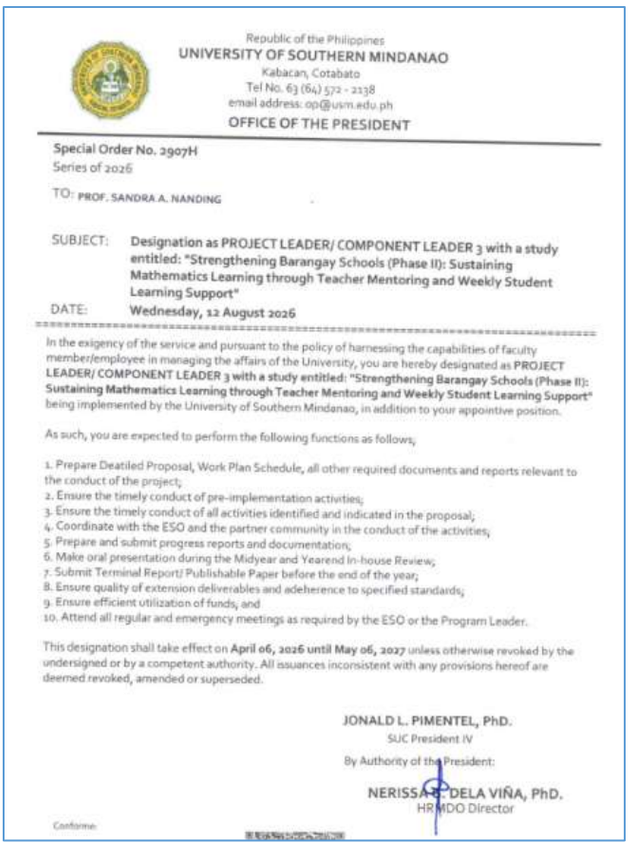
In the exigency of the service and pursuant to the policy of harnessing the capabilities of faculty member/employee in managing the affairs of the University, you are hereby designated as PROJECT LEADER of the project entitled, "Strengthening mother-tongue based education of elementary teachers in Dep-Ed 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.



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Kabacan, Cotabato
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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.

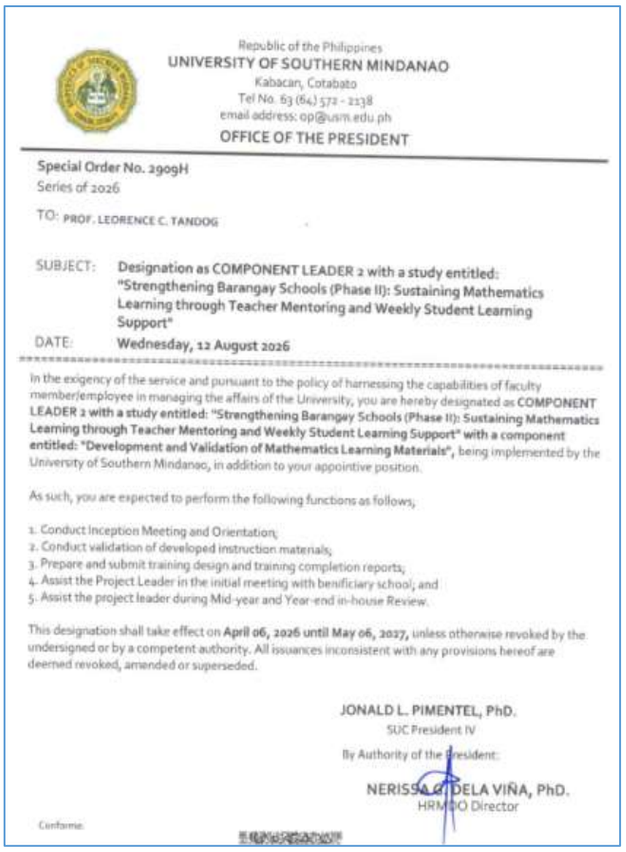
This designation shall take effect on **April 06, 2026 until May 06, 2027** unless otherwise revoked by the undersigned or by a competent authority. All issuances inconsistent with any provisions hereof are deemed revoked, amended or superseded.

JONALD L. PIMENTEL, PhD.
SUC President IV

By Authority of the President:

NERISSA C. DELA VIÑA, PhD.
HRMDO Director

Conforme:



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Kabacan, Cotabato
Tel No. 63 (64) 572 - 2138
email address: op@usm.edu.ph
OFFICE OF THE PRESIDENT

Special Order No. 2909H
Series of 2026

TO: PROF. LEORENCE C. TANDOG

SUBJECT: **Designation as COMPONENT LEADER 2 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 **COMPONENT LEADER 2 with a study entitled: "Strengthening Barangay Schools (Phase II): Sustaining Mathematics Learning through Teacher Mentoring and Weekly Student Learning Support" with a component entitled: "Development and Validation of Mathematics Learning Materials"**, 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. Conduct Inception Meeting and Orientation;
2. Conduct validation of developed instruction materials;
3. Prepare and submit training design and training completion reports;
4. Assist the Project Leader in the initial meeting with benificiary school; and
5. Assist the project leader during Mid-year and Year-end in-house Review.

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:

3. OUTCOMES

- Present manifestations that there is wholesome coordination between the Extension implementers and the target clientele/beneficiaries.

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 1. 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			

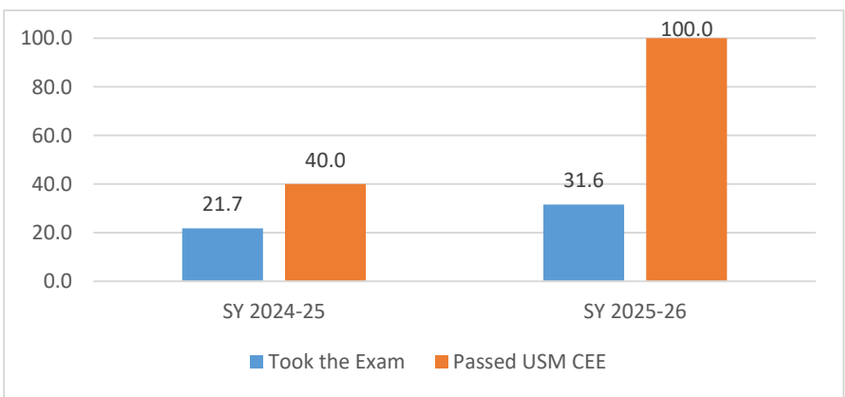


Figure 2. Comparative performance of Senior HS students in USMCEE

Photo documentation



Figure 1. *Group photo of College of Science and Mathematics faculty members together with the elementary school teachers of Nangaan Elementary School following the activity.*



Figure 2. *Group photo of faculty members alongside the training-workshop participants, including DepEd school teachers and student*

4. BEST PRACTICES

- Cite as many best practices as you can on Parameter D (Community Involvement and Participation in the Institution's Activities).

❖ **Needs Assessment and Inception Meeting**

- Initiating extension projects through formal courtesy meetings with local officials to establish trust and ensure mutual alignment before executing activities.
- Conducting structured diagnostic assessments and stakeholder interviews to identify genuine skill gaps and tailor intervention strategies directly to community needs.
- Actively seeking stakeholder feedback to integrate native languages and ethnomathematical practices into instructional materials to foster cultural pride and conceptual understanding.

❖ **Formal Institutional Partnerships**

- Binding institutional commitments through formal Memoranda of Agreement with key partner agencies to define explicit obligations, shared goals, and resource allocations.
- Mapping extension activities to official university Research, Development, and Extension (RDE) priority areas (e.g., *Quality Learning, Skills Development, and Literacy*).
- Formalizing faculty commitment by issuing University Special Orders (SO) from the Office of the President.

❖ **Capacity Building**

- Engaging university faculty, students, and local school teachers in co-designing, validating, and refining self-instructional Learning Activity Pages.
- Providing Continuing Professional Development (CPD) units for teacher training-workshops to support local educators' credentials and lifelong learning.
- Training beneficiary teachers and graduate students in conducting classroom-based Action Research and Design-Based Research to continuously measure and refine instructional tools.

❖ **Mentoring Support**

- Allocating regular, dedicated days (e.g., weekly Friday deployments) for direct classroom support, monitoring, and student-teacher mentoring.
- Conducting review sessions for rural Senior High School students preparing for College Entrance Examinations (USMCEE) to enhance socio-economic mobility and access to higher education.
- Providing specialized faculty coaching for students participating in district and municipal Damath and Mathematics Olympics competitions.

❖ **Involvement and Resource Outsourcing**

- Actively involving university leaders, faculty, graduate students, undergraduate student volunteers, and administrative staff across all operational stages including venue setup, attendee registration, and activity facilitation.
- Partnering with external academic institutions to invite guest speakers and domain experts to enrich local training.
- Maintaining flexibility and prioritizing team/participant safety by establishing alternative remote coordination, online presentations, and rescheduling protocols during disruptions like earthquakes or security conflicts.

❖ **Systematic Monitoring, Feedback, and Documentation**

- Submitting structured Quarterly Accomplishment/Monitoring Reports and Terminal Reports to the University Extension Services Office to track target completions and budget utilization.
- Utilizing comprehensive post-training evaluation sheets and beneficiary satisfaction surveys to measure project impact and drive future extension designs.

5. EXTENT of COMPLIANCE with the Team Recommendations for Area VI – Extension and Community Involvement in the last Survey Visit.

   - Present the status of Compliance Matrix of Area VI focusing on interventions done on the recommendations

     Duly Accomplisehed Self-Survey Instrument

   - Present the Summary of Findings and Recommendations for Area VI (Extension and Community Involvement) during the Preliminary Survey Visit (July 14 – 18, 2025) in terms of;

     1. Strengths
     2. Areas Needing Improvement
     3. Recommendations
     4. Present the Summary of Ratings on the quantitative assessment on Area VI

AREA	AREA MEAN
VI. Extension and Community Involvement	**3.09**

AACCUP TECHNICAL REVIEW AND BOARD ACTION

(For Preliminary Survey)

S U C: University of Southern Mindanao

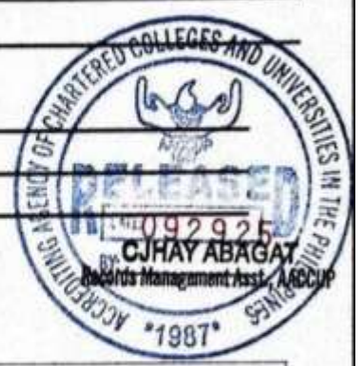
Address: Kabacan, North Cotabato Region: XII

College/Dept.:

Program: Bachelor of Science in Applied Mathenmatics

Components/Majors:

Date of Survey: July 14-18, 2025



SUMMARY OF RATINGS:

AREA	AREA MEAN
I. Vision, Mission, Goals *and* Objectives	3.44
II. Faculty	3.45
III. Curriculum *and* Instruction	3.29
IV. Support to Students	3.09
V. Research	3.67
VI. Extension *and* Community Involvement	3.09
VII. Library	3.79
VIII. Physical Plant *and* Facilities	3.10
IX. Laboratories	3.21
X. Administration	3.78
Total	33.91
Grand Mean	3.39

Minimum required grand mean to pass: 1

RECOMMENDED BOARD ACTION:

☑ Award Candidate Maximum Duration of Validity August 1, 2025 – July 31, 2027

☑ May apply for First Survey Visit.

☐ Within six (6) months after the Preliminary Survey for programs with a grand mean of 4 – 5.

☑ Not earlier than one (1) year after the Preliminary Survey for programs with a grand mean of 2.5 – 3.9.

☐ Not earlier than two (2) years after the Preliminary Survey for programs with a grand mean of 1 – 2.4.

☐ Defer the award of Candidate Status and conduct another Preliminary Survey for programs with a grand mean of less than 1.

Technical Review – University of Southern Mindanao – Kabacan Campus
Bachelor of Science in Applied Mathematics

SSESSED BY ACCREDITOR/S:

The Accreditor's field of specialization is the same as, or closely allied to the program that was assessed. Yes

Accreditor:	Prof. Mildred A. Sebastian
Academic Rank:	Associate Professor V
Field of Specialization:	Mathematics
Institution and Address:	Cavite State University, Bagtas, Tanza, Cavite

Accreditor:	
Academic Rank:	
Field of Specialization:	
Institution and Address:	

SUGGESTIONS: (Only those with check mark)

- ☑ 1. Review the Preliminary Survey results, item by item, and act accordingly, i.e., complete or improve those that are rated "inadequate", and prepare those that are rated "not available"
- ☑ 2. Comply with the recommendations made under each Area.
- ☑ 3. After complying with suggestion numbers 1 and 2:
  - ☑ Prepare an updated Program Performance Profile (PPP), to be submitted to the Accreditors upon their arrival for the 1st Survey Visit.
  - ☑ Conduct a Self-Survey of the program using the appropriate Survey Instrument.
- ☑ 4. Apply officially in writing for the conduct of the First Survey Visit, specifying therein the preferred date of visit.
- ☐ 5. Prepare for a repeat Preliminary Survey.

Consolidated *and* Reviewed By:

DR. ERWIN P. LACANLALE _____ **MILABEL E. HO, Ed.D., R.N.**