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DESIGN AND DEVELOPMENT OF A COMPETENCY BASED PHOTO-VOLTAIC INSTALLATION AND MAINTENANCE TRAINER

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ABSTRACT

This study aimed to design and develop an innovated competency-based photovoltaic (PV) installation and maintenance trainer to enhance technical-vocational instruction in the field of renewable energy. The research employed a combination of design and development, experimental, and descriptive methods to guide the creation and evaluation of the trainer. Conducted at Surigao Norte State University, the study involved 10 electrical instructors and 40 Electrical Installation and Maintenance (EIM) students who assessed the device using a validated questionnaire. Results from functional analysis revealed that the innovated trainer significantly outperformed the existing PV trainer in functionality, reliability, usability, efficiency, maintainability, and portability. The device was designed with modular components and integrated features conducive to competency-based learning, all while maintaining a lower production cost of ₱23,593.00. A detailed Gantt chart outlined the development timeline, while the construction and assembly procedures were carefully documented to ensure replicability. The final product was tested for performance and operational safety, confirming its effectiveness as a practical teaching tool. The study recommends instructor training, device enhancement, regular maintenance, and consideration for intellectual property protection to maximize its educational value and sustainability.

Keywords: PV installation, Trainer Device, Innovation, Instructional material, Perceptions

INTRODUCTION

The rapid advancements in technology have necessitated continuous adaptation across various fields, including education. These technological shifts demand the development of innovative instructional tools that align with educational goals to produce competent individuals equipped with relevant skills. To meet this need, the creation of effective and practical learning resources is essential, particularly in technical and vocational education.

Saga (2006) emphasized that technology innovation involves the development and application of new technologies aimed at improving current methods and tools. Such innovations utilize available resources to introduce improved solutions that address existing challenges. These advancements are the result of creative mental and physical efforts aimed at achieving desired outcomes. In the context of photovoltaic installation and maintenance, adequate instructional materials are crucial. These materials serve as primary resources that guide students in mastering technical concepts and practical applications. Effective instructional tools may include textbooks, electronic content, laboratory equipment, and simulation kits designed to ensure experiential learning in a safe environment.

The inherent risks involved in electrical circuit installation activities highlight the importance of innovative training tools. Traditional methods often expose students to hazardous voltages, which may result in accidents or injuries. To address this concern, the researcher developed a competency-based photovoltaic installation and maintenance trainer. This innovative device offers a safer, low-voltage alternative for simulating photovoltaic installation activities. Unlike traditional methods that may result in mate-

rial wastage, this trainer is cost-effective, reusable, and designed to enhance skill development through practical, hands-on learning.

By incorporating low-voltage simulation techniques, the photovoltaic installation and maintenance trainer minimizes risks while providing a realistic training experience. This innovation aims to equip learners with the necessary competencies to perform photovoltaic installation and maintenance tasks safely and effectively.

STATEMENT OF THE PROBLEM

This study attempts to design and develop an innovated competency-based photovoltaic installation and maintenance trainer.

Specifically, this study attempted to answer the following sub-problems:

1. What is the functional analysis of the innovated competency-based photovoltaic installation and maintenance trainer compared to existing PV trainer?
2. What design will be drawn in the development of the innovated trainer based on the findings in analysis phase in terms of:
Technical features; and
Costing?
3. What technical procedures and timetable will be undertake in the development of the innovated competency-based photovoltaic installation and maintenance trainer?

METHODOLOGY

Research Design

The study utilized the combination of design and development, experimental and descriptive method. Design and development was used since the study dealt with the process of circuit design and the fabrication of the device. The descriptive method is used because it involved the collection of data concerning the respondents' perception on the design of the device.

Research Environment

The actual fabrication of the device and the conduct of the research was primarily done at the electrical shop of the Surigao Norte State University, City Campus, located at Narciso Street, Surigao City in the Province of Surigao del Norte. The materials used in the study were collected from local market establishment at different places where the materials are available.

Research Respondents

The respondents of the study are 10 Electrical Instructors and trainers and 40 Electrical Installation and Maintenance (EIM) Students of the said University.

Research Instrument

The adopted questionnaire from previous related studies was used to gather the necessary data and information of the study. The respondents has answered and selected their best choices as to their perception on the proposed device. There are two sets of questionnaire on the third problem for comparison of the two device used in electrical installation.

Data Analysis

The data gathered in the course of the study are analyzed and interpreted. In determining the profile of respondents; percentage would be used. Weighted mean would be used for the acceptability and effectiveness of the device. T-test would be used for the test of Significance Effect of the students' performance.

RESULTS AND DISCUSSIONS

Functional analysis of the innovated competency-based photovoltaic installation and maintenance trainer over existing PV trainer.

Table 1. Observation of the experts based on the parameters

Pre-Analysis	Existing PV Trainer					Innovated Competency based PV trainer				
Functionality	1	2	3	4	5	1	2	3	4	5
Reliability	1	2	3	4	5	1	2	3	4	5
Usability	1	2	3	4	5	1	2	3	4	5
Efficiency	1	2	3	4	5	1	2	3	4	5
Maintainability	1	2	3	4	5	1	2	3	4	5
Portability	1	2	3	4	5	1	2	3	4	5

5- Excellent, 4-Very Good, 3-Good, 2-Fair, 1 –Poor

The data presented in Table 1 reveals a comparative evaluation of the existing photovoltaic (PV) trainer and the innovated competency-based PV installation and maintenance trainer, based on expert assessments across six key parameters: functionality, reliability, usability, efficiency, maintainability, and portability. The innovated trainer consistently scored higher across all these parameters, indicating significant enhancements in its overall design and performance. These improvements reflect current pedagogical trends in technical-vocational education, which advocate for hands-on, modular, and competency-based approaches to ensure industry-relevant skills development (Amante & Manzano, 2023; Tesoro et al., 2022). For instance, the innovated trainer's improved functionality and usability suggest a more interactive and learner-centered interface, likely integrating real-time simulations and component modularity that mimic real-world PV systems.

Furthermore, higher scores in efficiency, maintainability, and portability highlight the innovated trainer's adaptability to various learning environments and its ease of use over time—critical attributes in addressing the logistical and technical demands of renewable energy education. Its superior reliability indicates stable performance under extended and diverse operational conditions, which supports the continuity of practical learning without technical disruptions (Bautista et al., 2024). According to recent findings by UNESCO-UNEVOC (2023), modern TVET tools must support flexibility and field-based applications to adequately prepare students for dynamic green energy sectors. Thus, the results of this functional analysis validate the innovated trainer as a more effective educational tool, aligned with global calls for advanced and responsive learning technologies in the field of solar PV installation and maintenance.

Design of innovated competency-based photovoltaic installation and maintenance trainer in terms of Technical features and costing

The following figures shown below is the two-dimensional and three-dimensional design of the developed competency-based photovoltaic installation and maintenance trainer drawn using CAD system.

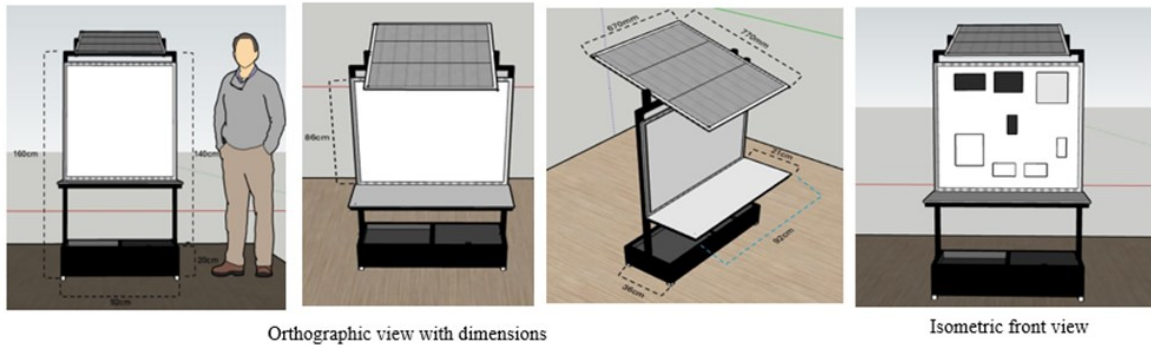


Figure 1. 2 Dimensional design of the device

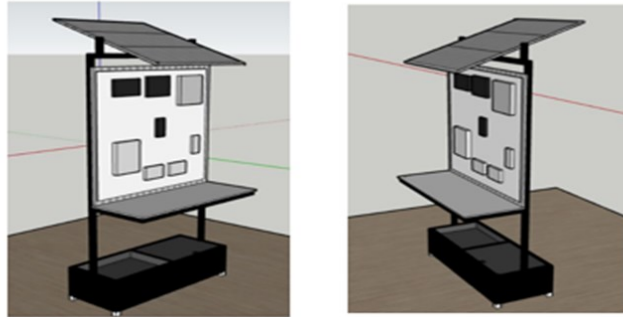


Figure 2. 3 Dimensional design of the device

Table 1. Total costing of the material for Innovated PV Trainer

Qty	Unit	Description of materials	Unit cost	Total cost
5	PCS	Square tube 1x1 1.5	P259.00	P1,295.00
1	PC	Steel Plain sheet	P690.00	P690.00
5	PCS	Cutting/grinding/polishing disc	P55.00	P275.00
20	PCS	Railbits	P7.00	P140.00
50	PCS	Welding rod	P3.00	P150.00
4	PCS	Wheels roller	P92.00	P368.00
5	PCS	Spray paint	P80.00	P400.00
100	PCS	Wood screw	P2.00	P200.00
1	PC	White board 1/4	P700.00	P700.00
1	PC	Mono solar panel 100watts	P6,000.00	P6,000.00
1	PC	Solar panel extension cable	P1,599.00	P1,599.00
5	METERS	2.5/4/6mm wires	P360.00	P1,800.00
1	PC	12v 200amp. Charge/winch relay	P264.00	P264.00
3	PCS	Dc MCB 40A	P316.00	P948.00
1	PC	Ac MCB 40A	P324.00	P324.00
1	PC	Automatic transfer switch (ATS)	P1,318.00	P1,318.00
1		Xh-m609 12-36v/low voltage protection module	P300.00	P300.00
1	PC	3000watts power inverter dc modified sine wave	P1,200.00	P1,200.00
1	PC	MPPT solar charge controller	P800.00	P800.00
40	PCS	4mm banana jack male/female connector	P49.00	P1,960.00
2	Pcs	2 gang outlet w/ white box	P149.00	P298.00
4	Meters	Soldering led 60/40	P16.00	P64.00
1	PAIR	Crocodile Clip	P100.00	P100.00
1	PC	12v Battery	P2,400.00	P2,400.00
TOTAL COST OF MATERIALS:				P23,593.00

Table 1 shows the total costing of the developed device is ₱ 23,593.00, this indicates that is cheaper than the current price of existing PV trainer. Other material used is plywood. It was not included in the costing because this is a recycled material used by the researchers.

Procedures and Timetable in the Development of the innovated competency-based photovoltaic installation and maintenance trainer

Table 2. Gantt chart in the development of the trainer

Activities	March 03-07,2025	March 10-18, 2025	March 19-27, 2025	March 27- April 08, 2025
1. Define Objectives & Competencies				
2. Research & Curriculum Development				
3. Design System Layout				
4. Procure Components				
5. Assemble Trainer Setup				
6. Testing & Validation				
7.Trainer Orientation/Documentation				

As shown in the table 2, activity of development is finished within thirty fifteen days. Usually, the researchers developed the product during their spare time, so that they can perform their specific task assigned to them. However, if a specialized or skilled person did the development process of device, possibly it can be finished within two (2) to three (3) days only.

The development process of the developed device started when the researchers bought the necessary materials needed during its creation. The preparation of the tools and equipment is also part of it. Other processes are measuring, cutting, drilling, polishing, grinding, attaching, assembling, mounting, wiring and commissioning the device.

Technical procedures undertaken in the development of the innovated competency-based photo-voltaic installation and maintenance trainer

Construction Procedure

1. Gather all necessary tools, materials, and equipment.
2. Measure and cut the steel tubular bars according to modular dimensions.
3. Assemble the steel frame and attach the plain sheet to enclose the battery and tool compartments.
4. Install the wiring board, steel brackets for the solar panel, and hinges for the tool box.
5. Confirm that the modular frame is ready for circuit installation.

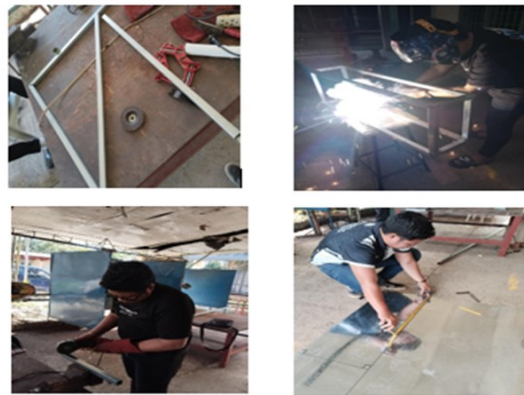


Figure 3. Construction Procedure of the trainer

Trainer Assembly Procedure

1. Set up the wiring board and install devices such as the charge controller, inverter, relay, ATS, and outlets.
2. Drill holes beside each device for wire access and female jack connectors.
3. Insert female jack connectors and prepare male banana jack wires for connections.
4. Test the wiring board for resistance and ensure no grounding issues.
5. Solder all wires to connectors, trim excess wire, and test the complete circuit using the solar panel and battery.



Figure 4. Trainer Assembly Procedure

Final Product Assembly & Testing

1. Install all components on the wiring board using proper tools (e.g., inverter, charge controller, ATS, relay, circuit breakers, etc.).
2. Test the continuity of the connections with a multimeter.
3. Power the trainer using the solar panel and battery to verify full functionality.

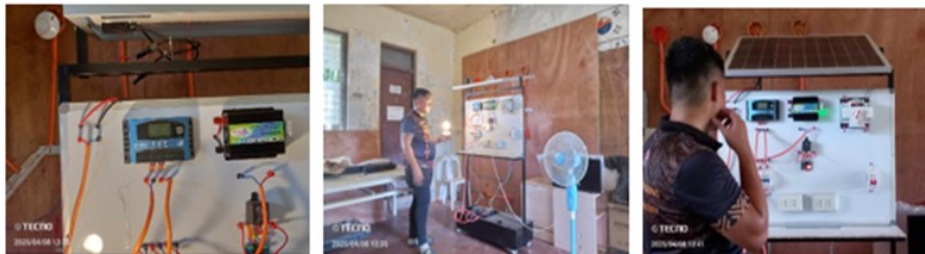


Figure 5. Final Product Assembly & Testing

Operating Procedure

1. Set up the trainer in a well-lit, safe workspace.
2. Position the solar panel under direct sunlight.
3. Use banana jack connectors to assemble all components securely.
4. Check all connections using a multimeter before switching on the system.
5. Keep the circuit breaker off while setting up and observe all safety precautions.
6. Follow instructor guidance for operation and monitor the charging process via the charge controller.
7. After use, turn off the circuit breaker, disconnect all connectors, and store equipment properly.



Figure 6. Operating Procedures

RECOMMENDATIONS

1. Electrical instructors and professors should receive training and familiarization with the PV trainer device to effectively use it as an instructional tool. Workshops, seminars, or tutorials should be organized to ensure that instructors are proficient in utilizing the device.
2. Continuously develop and expand the device's capabilities to cover a wider range of electrical circuit concepts. This will make it a versatile tool for instructors, catering to a variety of instructional needs.
3. Establish a regular maintenance schedule to keep the device in optimal working condition. This will ensure its longevity and reliability in educational settings.
4. The administration may provide assistance for patenting of this developed device for IP protection and also to augment the scarcity of electrical technology instructional materials for effective instruction

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DEVELOPMENT AND EVALUATION OF SHRIMP SHELL FLOUR-BASED NUGGETS

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ABSTRACT

Shrimp shells, a prevalent seafood processing byproduct, present untapped potential for value-added food innovation due to their high nutritional content, including proteins, minerals, and chitin. This study developed a novel food product—shrimp shell flour-based nuggets—by converting shrimp shells into flour and incorporating it into nugget formulations. Using a developmental and mixed-methods research design, the study assessed the physicochemical composition, nutritional profile, and sensory acceptability of the product. Results showed that shrimp shell flour is rich in protein and minerals, and the resulting nuggets contained high protein content (44.0 g/100g) but also notable fat and sodium levels. Sensory evaluation by both food experts and consumers indicated favorable acceptance, particularly in taste and texture. This study supports environmental sustainability by reducing seafood waste and aligns with the UN Sustainable Development Goals and the Philippines' Ambisyon Natin 2040. It demonstrates the viability of transforming waste into nutritious, affordable, and eco-friendly food products, contributing to responsible consumption, health promotion, and economic opportunities in coastal communities. Recommendations include reducing fat and sodium content and exploring alternative cooking methods to enhance the health benefits of the product.

Keywords: Shrimp Shell Flour, Sustainable Food Innovation, Nutritional Value, Food Waste Utilization, Sensory Acceptability

INTRODUCTION

Shrimp and other crustacean shells remain as the main byproduct of seafood processing and are often discarded as waste. However, these shells possess significant potential for added value due to their high nutritional content, including proteins, minerals, and chitin. Recycling shrimp shells into novel food products offers an opportunity to reduce waste, enhance sustainability, and create value in food systems. This study explores the use of shrimp shell flour as a key ingredient in producing nuggets, a versatile and widely consumed food product.

Globally, there is an increasing demand for alternative food ingredients that align with consumers' preference for healthy, nutrient-rich, and environmentally friendly products. Studies have demonstrated the success of unconventional food ingredients, such as Functional and sensorial properties of cookies enriched with Spirulina biomass (Delgado, N. G., et al. 2020) and fish scale collagen in supplements and edible films (Karthikeyan et al., 2021), in addressing these demands. Similarly, this study aims to innovate by using shrimp shell flour as a sustainable ingredient, addressing both nutritional needs and waste management.

This research directly aligns with the United Nations Sustainable Development Goals (SDGs), particularly Goal 12: Responsible Consumption and Production, and Goal 14: Life Below Water. By repurposing shrimp shells, the study reduces waste from the seafood industry and promotes sustainable resource use, thereby supporting efforts to protect marine ecosystems. Additionally, Goal 3: Good Health and Well-being is addressed through the development of nutritious, high-quality food products.

The integration of the i2Fame Framework is evident in this study's emphasis on innovation, sustainability, and consumer focus. The framework highlights the importance of innovative solutions for sustainable development, aligning with this study's goal of introducing a novel, nutrient-rich product to the market. By fostering partnerships with local seafood processors and leveraging available resources, the research promotes inclusive economic growth and supports environmentally responsible food production practices.

In the Philippine context, this study aligns with Ambisyon Natin 2040, which envisions a prosperous, predominantly middle-class society by 2040. Developing shrimp shell flour-based nuggets contributes to this vision by creating affordable, nutritious food products that are environmentally sustainable. Furthermore, it provides economic opportunities for coastal communities, particularly in Surigao, where seafood production is a key industry. By turning waste into value-added products, this study supports the broader goals of inclusive growth, environmental sustainability, and food security.

In summary, the development of shrimp shell flour-based nuggets is not only a response to local and global challenges of waste management and nutrition but also a step toward achieving a sustainable and prosperous future. This study seeks to create a market-ready product that embodies innovation, supports sustainable practices, and aligns with consumer acceptance regarding taste, texture, and overall quality.

STATEMENT OF THE PROBLEM

This study aimed to develop nuggets utilizing shrimp shell flour as the main ingredient. Specifically, it sought to answer the following questions:

1. What are the nutritional components of the developed shrimp shell flour?
2. What are the procedures and processes involved in the production of shrimp shell flour and the formulation of shrimp shell flour-based nuggets?
3. What is the physicochemical composition and nutritive value of nuggets using shrimp shell flour?

RESEARCH METHODOLOGY

Research Design

A developmental research design and mixed-methods research design will be used. Through the developmental design, this study developed a food product with nuggets as its formulation, using shrimp shell flour as the main ingredient. Through this, the product will be systematically developed and tested in its feasibility and acceptability.

Mixed methods of research design will be utilized for the assessment of the sensory acceptability of the product by appearance, aroma, texture, and taste. Furthermore, it will be utilized in nutritional composition evaluation of the shrimp shell flour-based nuggets to describe the processes and procedures involved in the preparation of such product. The combination of quantitative and qualitative methods would allow a better comprehension of both the product development and its acceptability among possible consumers.

Research Environment

The developmental research study on Shrimp Shell flour will be carried out in Food Technology Innovation Center in Surigao del Norte State University, Surigao. It is one of the university in CARAGA Region.

Respondents

This study considered Food Experts and Consumers in determining the acceptability of shrimp shell flour-based nuggets. Out of a total of 50 participants, 20 respondents, representing 40%, were food experts, while 30 respondents, accounting for 60%, were consumers. This distribution indicates that a significant proportion of the respondents were consumers, emphasizing the importance of gathering insights into consumer preferences and acceptability of the product. Meanwhile, the inclusion of food experts ensures that technical evaluations, such as sensory characteristics and potential improvements, are also

addressed. This balanced representation allows for a well-rounded analysis that integrates professional expertise with consumer perspectives.

Research Instrument

This study primarily focuses on formulating shrimp shell flour-based nuggets and assessing their acceptability through sensory evaluation. To evaluate the product's sensory characteristics, an adaptive questionnaire based on the Hedonic Scale will be utilized. The sensory attributes to be assessed include appearance, aroma, taste, and texture.

The evaluators will include Food Experts and consumers, purposively and randomly selected to provide a diverse yet focused panel. Multiple trials will be conducted to ensure that the final product meets the expected quality. The Hedonic Scale allows assessors to rate their level of preference, ranging from "Like Extremely" to "Dislike Extremely."

All sensory indicators will have five statements. This ensures the questionnaire captures a comprehensive and accurate measure of the assessors' preferences, serving as a robust basis for evaluating the acceptability of the shrimp shell flour-based nuggets.

Data Analysis

This study will employ the following statistical tools to analyze the data:

Percentages

This tool will help determine the proportion of shrimp shell flour in every formulation of nugget.

Mean and Standard Deviation

These statistical measurements will be applied in the evaluation were: to assess the acceptability of the sensory nugget of the developed shrimp shell flour based. Analysis and the data obtained of attributes such as appearance, aroma, taste, and texture will be subjected for numerical interpretation of the response that was given by the subjects.

RESULTS AND DISCUSSIONS

Nutritional Components of the Developed Shrimp Shell Flour

REPORT OF COMPUTATION OF NUTRITION FACTS				
Request Reference No.	: R13-042025-CHE-0213			
Location of Testing	: In-house			
Date Submitted	: April 14, 2025			
Date of Computation	: April 25, 2025			
Date of Issue	: April 25, 2025			
Sample Submitted	: Shrimp Shell Flour			
Submitted by	: Nicherly H. Abong			
Address	: Surigao del Norte State University – Narciso Street, Surigao City, Surigao del Norte			
Contact Number	: 09685091641			
Page	: Page 1 of 2			
Food Nutrient	Result of Chemical Analysis (per 100g)*	Amount of Food Nutrient per Serving Size (Rounded Value)	% Daily Value (based on 2000 Calorie Diet, Rounded Value)**	% RENI (based on FNRI reference adult requirement of males 19-29 years old)
Calories	264.41	130		5
Calories from Fat	11.97	5		
Total Fat (g)	1.33	0.5	1	
Sodium (mg)	61.20	30	1	
Total Carbohydrates (g)	50.21	25	9	
Protein (g)	12.90	6	12	9

*Based on the Report of Chemical Analysis
** The % Daily Value is based on the New Nutrition Facts Labeled finalized May 20, 2016

Fig. 1 result on Nutri facts of the developed shrimp shell flour

Figure 1 presents a detailed nutritional analysis of shrimp shell flour, highlighting its chemical composition and nutrient content per 100 grams. Key metrics include a calorie count of 264.41, with a breakdown of macronutrients, such as total fat, carbohydrates, and protein content. The percentages of daily values based on a 2,000-calorie diet are also provided, indicating the contribution of each nutrient to daily nutritional needs. This information is valuable for food scientists, nutritionists, and consumers alike,

as it aids in making informed dietary choices and understanding the health implications of incorporating shrimp shell flour into various food products.

REPORT OF CHEMICAL ANALYSIS

Request Reference No. : R13-042025-CHE-0212
 Location of Testing : In-house
 Date Submitted : April 14, 2025
 Date of Analysis : April 14, 2025 (Moisture)
 April 14 – 15, 2025 (Crude Protein)
 April 15 & 21, 2025 (Sodium)
 April 21, 2025 (Ash Content)
 April 23, 2025 (Total Fat)
 Date of Issue : April 25, 2025
 Sample Submitted : Shrimp Shell Flour
 Submitted by : Nicherly H. Abong
 Address : Surigao del Norte State University – Narciso Street, Surigao City,
 Surigao del Norte
 Contact Number : 09685091641
 Page : Page 1 of 2

Sample Code	Sample	Description	Parameter	Result
CHE – 0348	Shrimp Shell Flour	2x 145g in sealed PE bag	Moisture	10.72 g/100g
			Ash Content	24.84 g/100g
			Crude Protein	12.90 g/100g
			Total Fat	1.33 g/100g
			Sodium	61.20 mg/100g

Fig. 2 result on phytochemical analysis for shrimp shell flour

The figure 2 disclosed the chemical Analysis for shrimp shell flour provides essential insights into its compositional characteristics, crucial for both nutritional assessment and potential applications in food science. Conducted by the Surigao del Norte State University, the analysis reveals moisture content at 10.72 g/100g, indicating the flour's shelf stability. Additionally, the ash content is recorded at 24.84 g/100g, which suggests a notable mineral presence, vital for nutritional value. The crude protein content stands at 12.90 g/100g, reflecting the flour's potential as a protein source in various formulations. Lastly, the sodium level is measured at 61.20 mg/100g, providing insight into the product's suitability for different dietary needs. This comprehensive analysis aids in understanding the flour's functional properties and its role in health-conscious food products.

Processes and Procedures of making Shrimp Shell Flour and Formulation of making Shrimp Shell Flour Based Nuggets

Procedures and Processes in Making Shrimp Shell Flour

The following are the raw materials used in making the Shrimp Shell flour including its step-by-step procedures and processes.

Raw Materials:

- Fresh shrimp shells (cleaned)
- Clean water
- Dehydrator
- Pulverize Machine
- Sieve (fine mesh)
- Airtight storage container

Procedures/ processes:

Step 1: Collection and Cleaning

- Collect fresh shrimp shells (from peeled shrimp).
- Rinse thoroughly under running water to remove dirt, residual meat, or impurities.
- Blanch the shells in hot water for 2–3 minutes to reduce odor and surface bacteria. Drain completely.

Step 2: Drying

- Spread the cleaned shrimp shells evenly on dehydrator trays.
- Set the dehydrator temperature to 60°C to 70°C.
- Dry the shells for 12 to 18 hours, or until they are completely dry, crisp, and brittle.
(Drying time may vary depending on shell thickness and humidity.)

Step 3: Cooling

- Allow the dried shrimp shells to cool at room temperature for about 10–15 minutes before grinding.

Step 4: Grinding

- Place the cooled shells into a grinder.
- Grind until a fine powder consistency is achieved.

Step 5: Sieving

- Use a fine mesh sieve to remove larger particles.
- Re-grind any coarse particles collected by the sieve for uniform texture.

Step 6: Storage

- Transfer the shrimp shell flour into a clean, airtight container.
- Store in a cool, dry place, or refrigerate to prolong shelf life.



Fig. 3 processes in developing shrimp shell flour

Formulations of the developed Shrimp Shell Flour Based Nuggets

The following are the raw materials used in making the Shrimp Shell Flour Based Nuggets including its step-by-step procedures and processes.

Table 1. Formulations of the developed shrimp shell nuggets

Category	Ingredient	Quantity
Raw Materials Used	Shrimp Shell Flour	75g
	All-Purpose Flour or Cassava Flour	25g
	Minced Shrimp Meat	1 cup
	Egg	1
	Carrots (grated)	½ cup
	Onion and Garlic (finely chopped)	½ cup
	Salt	1 tsp
	Black Pepper	½ tsp
Coating and Cooking	Cornstarch	½ cup
	Breadcrumbs	1 cup

The table 1 presents the formulations in preparing a shrimp-based food product, distinguishing between raw materials and those intended for coating and cooking. The primary ingredients include 75g of shrimp shell flour and 1 cup of minced shrimp meat, indicating a strong seafood component, while the addition of all-purpose or cassava flour provides a binding base. Complementary vegetables like grated carrots and finely chopped onion and garlic enhance both flavor and texture. Seasonings such as salt and black pepper are used for taste enhancement. For coating and texture, cornstarch and breadcrumbs are included, suggesting that the product may be fried or baked for a crispy finish. This combination of ingredients highlights a nutritious, flavorful, and potentially sustainable dish utilizing shrimp by-products.

Processes in the development of Shrimp Shell Flour Based Nuggets

1. Prepare all the ingredients. Measure them to get the right amount needed.
 - Peeling the Carrots, Onion & Garlic
 - Sifting and measuring the shrimp shell flour and all-purpose flour.
 - Mincing the carrots, onion, garlic and Shrimp meat using food processor

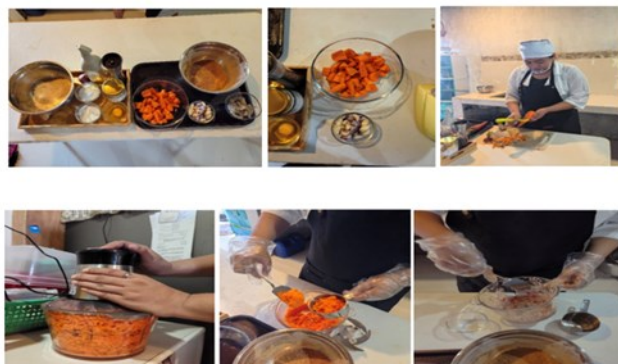


Fig. 4 preparations of all ingredients

2. Combine shrimp shell flour, minced shrimp meat, and all-purpose flour.



Fig. 5 combining all the ingredients

3. Mix in vegetables, seasonings, and add the beaten egg gradually for the right texture



Fig. 6 mixing the ingredients

4. Mix well and Shape into nuggets, coat with breadcrumbs.



Fig. 7 shaping nuggets with breadcrumbs

5. Deep fry in hot oil at 170-180°C until golden brown then let it cool in preparation for packaging.



Fig. 8 deep frying of nuggets

6. Let the nuggets cool at room temperature and pack in an airtight container for packaging.



Fig 9. Cooling and packaging of nuggets

Physicochemical Composition and Nutritive Value of Nuggets using Shrimp Shell Flour

REPORT OF CHEMICAL ANALYSIS

Request Reference No. : R13-042025-CHE-0216
 Location of Testing : In-house
 Date Submitted : April 14, 2025
 Date of Analysis : April 14, 2025 (Moisture)
 April 14 – 15, 2025 (Crude Protein)
 April 15 & 21, 2025 (Sodium)
 April 21, 2025 (Ash Content)
 April 22, 2025 (Total Fat)
 Date of Issue : April 25, 2025
 Sample Submitted : Shrimp Shell Nuggets
 Submitted by : Nicherly H. Abong
 Address : Surigao del Norte State University, Surigao City, Surigao del Norte
 Contact Number : 09685091653
 Page : Page 1 of 2

Sample Code	Sample	Description	Parameter	Result
CHE – 0352	Shrimp Shell Nuggets	2x 135g in sealed PE bag	Moisture	28.36 g/100g
			Ash Content	4.90 g/100g
			Crude Protein	40.24 g/100g
			Total Fat	25.19 g/100g
			Sodium	444.09 mg/100g

Fig. 10 result on the physico chemical analysis of the developed shrimp shell nuggets

Figure 10 disclosed the result of Chemical Analysis for shrimp shell nuggets presents a comprehensive evaluation of its nutritional profile, essential for understanding its potential uses in food products. Conducted by the Surigao del Norte State University, the analysis reveals a moisture content of 28.36 g/100g, which may affect the product's shelf life and texture. The ash content is noted at 4.90 g/100g, indicating the presence of minerals that contribute to its nutritional value. With a crude protein content of 40.24 g/100g, the nuggets demonstrate a significant protein source, making them suitable for incorporation into various diets. Additionally, the total fat content is measured at 25.19 g/100g, while the sodium level is quite high at 444.09 mg/100g, which may have implications for dietary restrictions. This analysis is pivotal for food scientists and nutritionists in assessing the health benefits and applications of shrimp shell nuggets in modern cuisine.

REPORT OF COMPUTATION OF NUTRITION FACTS				
Request Reference No. : R13-042025-CHE-0217				
Location of Testing : In-house				
Date Submitted : April 14, 2025				
Date of Computation : April 25, 2025				
Date of Issue : April 25, 2025				
Sample Submitted : Shrimp Shell Nuggets				
Submitted by : Nicherly H. Abong				
Address : Surigao del Norte State University, Surigao City, Surigao del Norte				
Contact Number : 09685091653				
Page : Page 1 of 2				
Food Nutrient	Result of Chemical Analysis (per 100g)*	Amount of Food Nutrient per Serving Size (Rounded Value)	% Daily Value (based on 2000 Calorie Diet, Rounded Value)**	% RENi (based on FNRI reference adult requirement of males 19-29 years old)
Calories	392.91	200		8
Calories from Fat	226.71	110		
Total Fat (g)	25.19	13	17	
Sodium (mg)	444.09	220	10	
Total Carbohydrates (g)	1.31	0	0	
Protein (g)	40.24	20	40	28

*Based on the Report of Chemical Analysis
 ** The % Daily Value is based on the New Nutrition Facts Labeled finalized May 20, 2016

Fig. 11 result on the Nutri-facts of the developed Shrimp shell Nuggets

As gleaned in figure 11 the nutrition information of the developed product reveals that is particularly high in fat content, containing 26.19g of total fat per 100g (17% of daily value), of which 20.57g is saturated fat (103% daily value). The product contains relatively low carbohydrates at just 1.31g per 100g (0% daily value) and moderate protein at 44.0g per 100g (88% daily value). The overall caloric value is substantial at 392.91 calories per 100g.

RECOMMENDATIONS

1. Reduce the saturated fat content in the shrimp shell nuggets to make them healthier and more suitable for individuals with dietary restrictions.
2. Lower the sodium level in the formulation to improve its suitability for those managing hypertension or sodium-sensitive diets.
3. Incorporate more vegetables in the nugget formulation to increase fiber content and enhance nutritional value.
4. Explore alternative cooking methods, such as baking or air frying, to reduce the overall fat content from deep frying.
5. Improve shelf life by optimizing moisture content through enhanced drying techniques or packaging solutions.

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DEVELOPMENT OF TUNAVORON USING TUNA (*Thunnus albacares*) FISHBONE POWDER: A CALCIUM FORTIFICATION

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ABSTRACT

This study explores the development of *Tunavoron*, a calcium-rich polvoron fortified with Yellowfin Tuna (*Thunnus albacares*) fishbone powder, aiming to address the underutilization of fish processing by-products in the Philippines. Employing an experimental design, tuna bones were processed through cleaning, pressure cooking, drying, and grinding to produce nutrient-dense powder, which was then incorporated into a polvoron formulation. The resulting product was evaluated for its nutritional value and sensory attributes using a structured sensory evaluation involving 50 respondents from diverse backgrounds. Laboratory analysis revealed the fishbone powder to be high in protein (32%), fat (16.4%), calcium (1.26%), and phosphorus (7.36%), supporting its potential as a functional food ingredient. The findings demonstrated that *Tunavoron* offers not only acceptable taste, texture, and appearance but also substantial health benefits, particularly in calcium supplementation. Despite a calcium-to-phosphorus ratio slightly below ideal, the product shows promise for addressing mineral deficiencies while contributing to sustainable food systems through seafood waste valorization. The study recommends further optimization of mineral balance, sensory enhancements, and sustainable packaging to support broader consumer appeal and potential commercial distribution. This research contributes to food innovation and waste management by showcasing how marine by-products can be transformed into marketable, health-enhancing snacks.

Keywords: Tuna fishbone powder, Functional food, Calcium fortification, Sustainable food product. Sensory evaluation

INTRODUCTION

The Philippine archipelago is rich in natural resources, including a diverse array of marine life. Fish species play a crucial role in the country's agricultural economy, contributing 22% of the total agricultural production value with 4.11 million metric tons produced annually across aquaculture, municipal, and commercial fisheries sectors (BFAR, 2022). This places the Philippines as the 11th largest fish-producing nation globally. Fish meat is one of the staple foods in the Filipino diet, which constitutes 18.3% of food consumption (FNRI, 2020). However, fish bones, a major by-product of fish processing, are mostly discarded, resulting in waste generation.

As noted by Prinaldi et al. (2018) and cited by Dewi (2021), advanced treatment methods involving acids and bases improve the whiteness, purity, and particle size of nanocalcium, achieving particles as small as 259 nanometers. These enhancements result in greater bioavailability compared to traditional calcium sources, positioning fishbone-derived nanocalcium as a potential ingredient for functional foods and dietary supplements. This easily absorbed calcium can be used by the pharmaceutical industry to help address deficiencies and promote bone health while supporting sustainability practices through effective by-product utilization. Benjakul (2017), as cited by Prinaldi (2018), has also established the bioavailability of yellowfin tuna bone powders, which are rich in calcium and phosphorus. These findings underscore their potential as biocalcium sources for food products and health supplements.

Additionally, such powders could be used to develop innovative market products like tunavoron, a calcium-fortified polvoron. This underscores the potential of yellowfin tuna bone powder in the food and wellness industries, paving the way for sustainable and value-added applications. Globally, waste management and sustainability have become central issues in food production sectors. For instance, fishbones have been processed into calcium-rich powders for health supplements, fertilizers, and bioplastics (Hamed et al., 2016, as cited by Matchar, 2019).

However, despite the existing studies, literature focusing on the utilization of fishbones remains limited. Thus, this study aims to address the research gap by exploring the development of Yellowfin Tuna (*Thunnus albacares*) bone powder and its applications. Specifically, this study will develop tunavoron, a calcium-rich polvoron derived from yellowfin tuna bone powder. The study will evaluate the nutritive value and acceptability of tunavoron, including its appearance, aroma, taste, and texture.

STATEMENT OF THE PROBLEM

This study aimed to develop Yellowfin Tuna (*Thunnus albacares*) bone powder into tunavoron (tuna-derived polvoron). Specifically, it will evaluate the nutritive value, sensory characteristics, consumer preferences, and acceptability of tunavoron (tuna-derived polvoron). Specifically, it sought to answer the following sub-problems:

1. What is the formulation and process of the Tunavoron using tuna fishbone powder?
2. What is the physico-chemical composition of the Tunavoron and its nutritional value?

RESEARCH METHODOLOGY

Research Design

This study adopts an experimental research design to assess the nutritive value and acceptability of Tunavoron, a nutrient-rich snack derived from Yellowfin Tuna bone powder. The experimental research design is chosen because it allows for controlled manipulation of variables, enabling the researcher to examine the cause-and-effect relationship between the product's composition and its nutritional and sensory outcomes. This approach is specifically suitable for the development of food products because it provides a systematic method through which hypotheses can be tested with regard to nutritional value and consumer preferences.

Research Environment

Surigao City is the capital of Surigao del Norte and is the most dynamic urban hub in northeastern Mindanao, Philippines. Known as the "City of Island Adventures, it functions as an economic, educational, and cultural center in the Caraga region. Its unique location at the Pacific border of the Philippine archipelago affords it access to rich marine biodiversity, enabling industries such as fishing and ecotourism. It features pristine waters and plenty of aquatic resources along its coastline and is an excellent setting for research projects that involve innovative exploitation of marine by-products.

A balanced combination of rural and urban socio-economic activities in the city truly creates a dynamic system for growth and development. Surigao City's strong fishing industry, particularly in harvesting tuna and other marine species, provides a steady supply of by-products like fishbones, which are often discarded. These by-products represent untapped potential for sustainable practices, such as converting them into nutrient-rich food products.

The experiments were conducted at the FTIC Laboratory of SNSU, an educational institution located in the region. This is a highly-equipped facility endowed with specialized tools and resources necessary for food experimentation, preparation, and evaluation. Its controlled setting ensures the safe and systematic conduct of trials, particularly in testing and refining food products derived from Yellowfin Tuna bone powder. The laboratory also offers an environment for sensory evaluation through quantitative methods used to assess the attributes of products.

Hence, the coastal environment of Surigao City, its fishing industry, and thrust for education provide the richest context for this study. FTIC in SNSU becomes the perfect venue for transforming underuti-

lized fish by-products into marketable food products, promoting sustainable practices, and enhancing local innovations.

Research Respondents

The study's respondents has total of 50 comprise the 10 faculty, 10 food-related workers, and 30 students from Cantiasay National High School. These groups represent a diverse population within the community, offering a broad spectrum of feedback essential for evaluating the acceptability of Tunavoron as innovative food products. Their inclusion provides varied perspectives due to their unique roles and experiences within the campus environment.

Faculty members are selected for their expertise, particularly in food science, nutrition, or related disciplines. Their professional knowledge makes them valuable respondents in assessing the nutritional value, feasibility, and innovation embedded in the food products. They provide constructive feedback on technical aspects such as taste, texture, and presentation while also considering the broader implications of the study, such as sustainability and marketability.

Food-related workers represent another segment of respondents with distinct preferences and practical insights into food products. Their perspectives help assess the products' appeal and utility as convenient and nutritious snacks. This group typically values affordability and ease of consumption, their feedback contributes to understanding potential market acceptance among working professionals.

Students are ideal respondents for evaluating due to their openness to trying new food products. Their youthful demographic provides valuable insights into the products' potential popularity among younger, health-conscious consumers. Students' feedback also reflects preferences for packaging design, flavor, and pricing, which are critical factors for marketability in this target group.

By engaging these three respondent groups, the study ensures a comprehensive evaluation of the food products' sensory attributes, acceptability, and feasibility, reflecting diverse consumer needs and preferences within the university setting.

Research Instrument

This research uses one instrument as primary tool in data collection: Sensory Evaluation Forms, to gather quantitative data necessary to support the objectives of this study. This was carefully crafted to evaluate the sensory attributes and consumer preferences, acceptability of Tunavoron, as well as the benefits and challenges of applying Yellowfin Tuna fishbone powder in this product.

The Sensory Evaluation Forms make use of the 9-point hedonic scale to quantify specific sensory attributes of the products such as appearance, aroma, taste, and texture. The scale runs between "dislike extremely" to "like extremely" allowing the respondent to give quantified feedback on the sensory experience. These forms also comprise comparative questions to enable participants to grade the acceptability of Tunavoron in comparison with common snacks like polvoron. The data from these forms are analyzed statistically for trends, measures of preferences, and overall appeal of the products.

The Consumer Acceptability Survey, embedded within the sensory evaluation, delves into participants' willingness to consume the products and their overall enjoyment. These questions address the products' potential for regular consumption and satisfaction levels. Open-ended sections in the survey provide respondents with the opportunity to share detailed insights and constructive feedback, allowing researchers to explore nuances in consumer preferences and identify areas for product improvement.

Sensory evaluation forms will provide precise feedback, thereby providing a comprehensive assessment and optimization of Tunavoron and as they approach market readiness from scientific and consumer-related aspects of product development.

Data Analysis

The following statistical tools were used to analyze the collected data of the study.

Frequency Count and Percentage Computation. These tools will be used to quantify the profile of the respondents.

Weighted Mean. This will be used to identify the central tendency of the respondents' responses on the sensory characteristics and acceptability of Tunavoron.

Standard Deviation. This will be used to identify the degree of dispersion from the mean of the respondents' responses on the sensory characteristics and acceptability of Tunavoron.

One-Way Analysis of Variance (ANOVA). This tool will be used to determine the differences among the various concentrations used for each flour sample in terms of aroma, appearance, taste, and texture.

RESULTS AND DISCUSSIONS

Formulation and Process of the Tunavoron using tuna fishbone powder

Process in Tuna Fishbone Powdering

The following are the procedural steps in the development of tuna fishbone powder:

- Selecting and cleaning the bones thoroughly
- Removing meat, skin, and blood from the tuna bones
- Soaking in cold water with a bit of vinegar or lemon juice
- Pressure cooking for 2 hours at 10 psi
- Aiy fryer-drying at 200 C for about 10-15 minutes
- Lightly roasting the dried bones
- Grinding until powdery using blender or food processor
- Sifting through a fine mesh to remove any hard chunks
- Packaging and Storing.



Figure 1. Process of powdering tuna fishbone

Formulation and Processes in Tunavoron Making

Table 1. Formulation of the tunavoron food product.

Ingredients	Volume/Amount Used	Percentage (%)
Tuna fishbone powder	1 cup	10%
All-purpose flour	2 cups	20%
Skimmed milk	2 cups	20%
White sugar	1 cup	10%
Butter	4 cups	40%
Vanilla extract	2 tbsp (approx. 1/8 cup)	~1%
Total	10 1/8 cups	~101%*

**Rounded figures — minor deviation due to conversion of tablespoon to cup for vanilla extract.*

The table 1 disclose the formulation of the food product that converts the given ingredient volumes into percentages to help understand their relative proportions. Butter has the highest share (40%), indicating its key role in providing fat and structure. Flour and milk each contribute 20%, serving as the primary base and nutritional binder. Tuna fishbone powder and sugar are moderate at 10% each — the former being the functional ingredient for added calcium, and the latter for sweetness. Vanilla extract, though minimal, adds aroma and flavor depth. This breakdown can help adjust the recipe for larger or commercial batches while maintaining the same sensory and nutritional profile.

Table 2. Processes in Tunavoron Making

Step	Process Description
1	Heat a pan over low fire.
2	Roast the all-purpose flour until light brown.
3	Add tuna fishbone powder and mix.
4	Stir continuously to prevent burning or uneven roasting.
5	Turn off heat and let the mixture cool slightly.
6	In a separate bowl, blend sugar, skimmed milk, and the flour–fishbone mixture.
7	Melt butter and mix with vanilla extract.
8	Combine butter–vanilla solution with the rest of the blended ingredients.
9	Mix thoroughly until a uniform dough-like consistency is achieved.
10	Cool the mixture, then mold into desired shapes.
11	Wrap and package the finished product.

The table 2 disclose the processes that breaks down each step for clarity and efficiency. The preparation starts with dry heat roasting, a method that develops a nutty flavor and eliminates any raw taste from the flour and fishbone powder. The blending of dry and wet components separately ensures smoother mixing. The final integration of butter and vanilla extract enriches the flavor and consistency. Cooling before molding is critical for shape retention, while wrapping ensures hygiene and shelf life. These steps are simple yet strategically ordered to balance texture, flavor, and food safety in making Tunavoron.



Figure 2. Process of Tunavoron making.

Laboratory Result for Physicochemical Analysis

TEST REPORT			
CUSTOMER	: NOEMI C. GONZAGA		
ADDRESS	: P-4, San Juan, Surigao City		
CONTACT PERSON	: Noemi C. Gonzaga		
CONTACT DETAILS	: noemigonzaga95@gmail.com		
SAMPLE(S) SUBMITTED	: TUNA FISH BONE POWDER (As Declared)		
SAMPLE CODE	: CD2503-1797-01		
SAMPLED BY	: Customer		
DATE / TIME RECEIVED	: 25 March 2025 / 8:17 AM		
DATE ANALYZED	: 05 – 21 April 2025		
ANALYZED BY	: L.G. DALAGUIT, M.M. TANO, J.A. CANATOY, S.S. GABULE		
DATE REPORTED	: 21 April 2025		
Parameters	Unit	Results	Test Method
Crude Protein (N x 6.25)	%	32.0	Kjeldahl
Fat	%	16.4	Mojonnier Extraction Method
Phosphorus	%	7.36	Colorimetric Method
Calcium	%	1.26	Flame AAS
Magnesium	mg/kg	1,977	
Iron	mg/kg	2.20	

Reference: Official Method of Analysis of AOAC International. 21st ed., 2019.

Results are those obtained at time of examination and relate only to the sample(s) tested.

Figure 3. Physicochemical analysis of the develop tunavoron product

Figure 1 disclose the laboratory analysis of tuna fishbone powder confirms its high nutritional and functional value. The powder contains **32.0% crude protein** and **16.4% fat**, both of which significantly enhance the dietary protein and energy content of food products like *Tunavoron*. These findings align with those of Kim et al. (2024), who reported that fishbone-derived powders contain substantial protein and lipid levels due to the residual meat and marrow content retained after processing. Additionally, the powder exhibits a notable **1.26% calcium** and **7.36% phosphorus** content, reflecting a Ca:P ratio close to 1:6 — slightly lower than ideal but still contributing meaningfully to dietary mineral intake. According to Kongsri, Techawongstien, and Rungseevijitprapa (2016), tuna bone powder offers a Ca:P ratio approximating that of human bones (2:1), making it a viable dietary supplement for bone health.

Furthermore, the bioavailability of calcium in tuna bone powder supports its role as a functional fortifier. Previous studies have demonstrated that the **in vitro calcium availability** from fishbone powder reaches over 50%, a level that rivals or surpasses commercial calcium salts (Kongsri et al., 2016). This suggests that the calcium in tuna fishbone is not only abundant but also efficiently absorbed by the human body. The presence of **1,977 mg/kg magnesium** and **2.20 mg/kg iron** further enhances its nutritional profile, supporting metabolic function, bone development, and oxygen transport (Wang et al., 2023). Incorporating this by-product into *Tunavoron* not only contributes essential nutrients but also aligns with circular economy principles by repurposing seafood waste into valuable food ingredients.

RECOMMENDATIONS

1. Improve the calcium-to-phosphorus ratio by adding complementary calcium-rich ingredients for better bone health benefits.
2. Enhance flavor and texture using sensory-friendly ingredients like cocoa or oats to boost consumer acceptability.
3. Use airtight, shelf-stable packaging to preserve the nutritional quality and extend the product's shelf life.
4. Market the product as eco-friendly and sustainable to appeal to health- and environment-conscious consumers.
5. Conduct pilot testing and include detailed nutrition labels to ensure product quality and regulatory compliance for commercial distribution.

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PAGPAPAHALAGA SA WIKANG FILIPINO BILANG KASANGKAPAN NG KOMUNIKASYON SA IBA'T IBANG KONTEKSTO: BATAYAN SA PAGPAPATIBAY NG ASIGNATURANG FILIPINO

VALUING THE FILIPINO LANGUAGE AS A TOOL FOR COMMUNICATION IN VARIOUS CONTEXTS: A BASIS FOR STRENGTHENING THE FILIPINO SUBJECT

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ABSTRACT

This study aims to determine the level of teachers' appreciation of the Filipino language in various contexts based on their profile. The research addressed the following problems: (1) What is the profile of the teachers in terms of (1.1) age, (1.2) gender, (1.3) first language, (1.4) educational attainment, and (1.5) number of years in teaching Filipino? (2) What is the level of teachers' appreciation of the Filipino language based on the following categories: (2.1) formal context, (2.2) social context, (2.3) medium of instruction, and (2.4) subject in basic education? The study employed a descriptive research design and was conducted among 25 Filipino teachers at Isabela National High School through purposive sampling. Data were gathered using a questionnaire with a Cronbach's Alpha of 0.966, indicating high reliability. Data were analyzed using frequency count, percentage, and mean. The results revealed that teachers exhibited a high level of appreciation for the Filipino language across all categories, with mean scores ranging from 3.96 to 4.00. The findings highlight the significant role of the Filipino language in enhancing communication skills, promoting cultural heritage, and expanding knowledge in secondary education.

Keywords: Formal context, social context, medium of instruction, basic education

ABSTRAK

Layunin ng pag-aaral na ito na tukuyin ang antas ng pagpapahalaga ng mga guro sa wikang Filipino sa iba't ibang konteksto batay sa kanilang profayl. Sinagot ng pananaliksik ang mga sumusunod na suliranin: (1) Ano ang profayl ng mga guro batay sa (1.1) edad, (1.2) kasarian, (1.3) unang wika, (1.4) antas ng natapos, at (1.5) bilang ng taon sa pagtuturo ng Filipino? (2) Ano ang antas ng pagpapahalaga ng mga guro sa wikang Filipino batay sa mga sumusunod na kategorya: (2.1) pormal na konteksto, (2.2) sosyal na konteksto, (2.3) midyum sa pagtuturo, at (2.4) asignatura sa batayang edukasyon? Gumamit ng deskriptibong disenyo ang pananaliksik at isinagawa sa 25 guro sa Filipino ng Isabela National High School sa pamamagitan ng purposive sampling. Ang datos ay nakalap gamit ang talatanungan na may Cronbach's Alpha na 0.966, na nagpapakita ng mataas na reliability. Sinuri ang datos sa pamamagitan ng frequency count, percentage, at mean. Lumabas sa resulta na mataas ang pagpapahalaga ng mga guro sa wikang Filipino sa lahat ng kategorya, na may mean na 3.96 hanggang 4.00. Ipinapakita ng mga natuklasan ang mahalagang papel ng Filipino sa pagpapaunlad ng komunikasyon, pagpapalaganap ng kultura, at pagpapalawak ng kaalaman sa sekondaryang edukasyon.

Mga Keyword: Pormal na konteksto, sosyal na konteksto, midyum sa pagtuturo, asignatura sa batayang edukasyon.

PANIMULA

Ang wika ay isa sa mga pinakamahalagang kasangkapan ng tao sa pakikipag-ugnayan at pagpapahayag ng damdamin, kaisipan, at kultura. Sang-ayon sa isang artikulo mula sa Philnews (2020), na ang wika ay nagsisilbing pangunahing daluyan para sa pagpapahayag ng mga ideya, damdamin, at pananaw ng tao. Bukod dito, ito rin ay mahalagang kasangkapan sa pagpasa ng kultura at mga kaugalian sa susunod na henerasyon. Malinaw na ang wika ay isang mahalagang instrumento na ginagamit upang maiparating ang ating mga niloloob at kaisipan. Ito'y hindi lamang isang paraan ng pakikipag-usap sa kapwa, kundi ginagamit din ito upang makipagtalakayan at makapagbahagi ng opinyon at kaisipan.

Ang pag-usbong at pag-unlad ng Wikang Filipino ay nagbigay-daan upang ito'y maging pangunahing kasangkapan sa paglinang ng kulturang Pilipino at pagpapahayag ng identidad ng bawat Pilipino. Sa kasalukuyan, ang wikang ito ay hindi lamang nagsisilbing tulay ng mga Pilipino sa isa't isa, kundi ginagamit na rin sa iba't ibang konteksto—mula sa edukasyon, pulitika, at mass media hanggang sa digital na komunikasyon at mga internasyonal na pakikipag-ugnayan.

Ayon sa Saligang Batas ng 1987 (Republic of the Philippines, 1987) ng Pilipinas, itinatakda na ang wikang Filipino ay dapat gamitin bilang wikang panturo sa mga paaralan at bilang wikang opisyal sa komunikasyon sa pamahalaan. Sinusugan ito ng K-12 kurikulum, na nagbibigay ng higit na diin sa paggamit ng Filipino sa iba't ibang larangan ng pag-aaral upang matiyak na ang wika ay magiging kasangkapan ng malawakang pagkatuto. Kaya, mahalagang maituro at mapalakas sa sistema ng edukasyon ang wikang Filipino.

Sa konteksto naman ng Matatag Kurikulum, ang Filipino ay itinuturing na pangunahing wika ng komunikasyon sa mga paaralan, at ang pagpapahalaga sa wika bilang instrumento ng kaalaman ay isang hakbang tungo sa isang matatag na edukasyong pambansa. Mahalaga ang wikang Filipino hindi lamang bilang kasangkapan sa pang-araw-araw na komunikasyon, kundi bilang pangunahing wika sa pagpapalaganap ng kultura, kasaysayan, at mga ideya. Sa pamamagitan ng pagsulong ng kurikulum na nakasentro sa Filipino, ang mga mag-aaral ay magkakaroon ng mas malalim na pag-unawa sa kanilang identidad bilang mga Filipino at sa kanilang papel sa pambansang pag-unlad.

Ang wikang Filipino ay may mahalagang papel sa paghubog ng identidad ng mga Pilipino. Sa pamamagitan ng edukasyon, nagkakaroon ng pagkakataon ang mga mag-aaral na matutuhan at maunawaan ang wikang ito, na nagsisilbing tulay sa pakikipagkomunikasyon at pakikilahok sa mga usaping panlipunan.

Ang edukasyon ay itinuturing na isa sa mga pangunahing haligi ng isang maunlad na lipunan. Ito ay hindi lamang nagsisilbing daan tungo sa mas mataas na kaalaman at kasanayan, kundi ito rin ay nagiging pundasyon ng pagkakaunawaan at pagpapahalaga sa sariling wika at kultura.

Sa ilalim ng K-12 kurikulum, layunin ng asignaturang Filipino na mas palawakin at paunlarin ang kasanayan ng mga mag-aaral sa paggamit ng wikang Filipino. Ang wastong pagkatuto ng wikang ito ay hindi lamang nakatutulong sa kanilang akademikong pag-unlad kundi pati na rin sa kanilang kakayahang makibahagi sa mas malawak na diskurso sa lipunan. Ang edukasyon sa wikang Filipino ay nagbibigay-diin sa kahalagahan ng komunikasyon, kritikal na pag-iisip, at pagmamalasakit sa sariling kultura, na mahalaga sa pagbuo ng makabansang pananaw at aktibong mamamayan (Department of Education, 2019).

Ang pagtuturo ng asignaturang Filipino sa K-12 kurikulum ay hindi lamang para sa pagkakaroon ng kasanayan sa wika, kundi bilang isang mahalagang bahagi ng kanilang edukasyon na naglalayong palakasin ang kakayahan ng mga mag-aaral na makipagkomunikasyon nang malinaw, kritikal, at mabisang makisangkot sa iba't ibang konteksto ng lipunan. Dagdag pa rito, ang paggamit ng Filipino sa akademikong diskurso ay nagbibigay-daan upang maging mas accessible ang mga kaalamang bayan at makapagtaguyod ng mas malalim na pambansang pagkakaisa (Department of Education, 2016)." Sa ganitong paraan, ang edukasyon ay hindi lamang isang proseso ng pagkatuto kundi isang paraan din ng pagpapalalim ng pagkakaunawa at pagpapahalaga sa wikang Filipino. Bukod dito, ang pagkakaroon ng matibay na pundasyon sa edukasyon sa wikang Filipino ay nagiging susi sa mas matagumpay na pakikisalamuha at pag-unawa sa mga hamon ng makabagong lipunan.

Batay sa UNESCO Sustainable Development Goals (SDGs) (2016), tungkol sa kahalagahan ng wikang Filipino bilang kasangkapan ng komunikasyon ay may direktang ugnayan sa mga layunin nito, partikular sa SDG 4 na naglalayong masiguro ang kalidad ng edukasyon. Sa pamamagitan ng paggamit ng wikang Filipino sa K-12 curriculum, pinapalakas nito ang pag-unawa at analitikal na kakayahan ng

mga mag-aaral, na nagbibigay ng pantay na pagkakataon, lalo na sa mga nasa malalayong lugar, at tumutulong sa pagbawas ng hindi pagkakapantay-pantay (SDG 10). Bukod dito, ang Filipino ay nagiging makapangyarihang kasangkapan sa pampublikong diskurso, na nagpapalakas sa boses ng mga tao sa mga isyu ng lipunan at nag-aambag sa mas makatarungan at mapayapang komunidad (SDG 16). Sa huli, ang paggamit ng wikang ito sa mga lokal na inisyatiba ay nagtataguyod ng pagkakaroon ng mga partnership sa pagitan ng mga gobyerno, institusyon ng edukasyon, at mga komunidad, na mahalaga para sa sustainable development (SDG 17). Ang pag-aaral na ito ay nagpapakita na ang pagkilala at paggamit ng wikang Filipino ay may malalim na epekto sa pagbuo ng mataas na kalidad ng edukasyon at sa pagpapalaganap ng mga layunin ng SDGs.

Sa kabila ng masigasig na pagpapahalaga sa Wikang Filipino bilang pangunahing kasangkapan ng komunikasyon, may mga natitirang puwang sa pananaliksik tungkol sa kahalagahan ng wikang ito sa iba't ibang konteksto ng modernong lipunan. Habang maraming pag-aaral ang tumalakay sa Filipino bilang wika ng edukasyon at kultura, limitado ang pananaliksik na sumisiyasat sa kung paano pinapahalagahan ang wikang ito sa kategoryang pormal na konteksto, sosyal na konteksto, midyum sa pagtuturo at bilang asignatura sa batayang edukasyon. Ang mabilis na pagbabago ng teknolohiya at mas bukas na pakikipag-ugnayan ng Pilipinas sa globalisadong mundo ay nagtatampok ng pangangailangan sa wika na umaangkop sa mga bagong konteksto at kasanayan.

Ang mananaliksik na ito ay lubhang naniniwala na ang Filipino ay hindi lamang wika ng tahanan, kundi isang wika ng pagkatuto at propesyonal na diskurso sa iba't ibang larangan. Kaya nga't ang pag-aaral na ito ay naglalayong matukoy ang pagpapahalaga sa wikang Filipino bilang kasangkapan ng komunikasyon na magsisilbing batayan sa pagpapatibay ng posisyon ng asignaturang Filipino. Sa pamamagitan ng pag-aaral na ito, umaasa ang mananaliksik na mabigyang-diin ang halaga ng wikang Filipino bilang mabisang kasangkapan ng komunikasyon at pang-akademikong kaalaman sa sistema ng edukasyon ng bansa.

PAGLALAHAD NG SULIRANIN

Ang pag-aaral na ito ay may layuning matukoy ang pagpapahalaga sa wikang Filipino sa komunikasyon sa iba't ibang konteksto bilang batayan sa pagpapatibay ng asignaturang Filipino. Sasagutin sa pag-aaral na ito ang sumusunod na mga tanong:

1. Ano ang profayl ng mga guro batay sa:
 - 1.1. edad;
 - 1.2. kasarian;
 - 1.3. unang wika;
 - 1.5. antas ng natapos; at
 - 1.6. bilang ng taon sa pagtuturo ng asignaturang Filipino?
2. Ano ang antas ng pagpapahalaga sa wikang Filipino ng mga guro batay sa persepsyon ng mga sa mga sumusunod na kategorya:
 - 2.1. pormal na konteksto;
 - 2.2. sosyal na konteksto;
 - 2.3. midyum sa pagtuturo; at
 - 2.4. asignatura sa batayang edukasyon?

METODO

Disenyo ng Pananaliksik

Gagamit ang mananaliksik ng descriptive o palarawan. Palarawan upang mailarawan ang propayl ng mga guro at antas ng pagpapahalaga ng mga guro sa wikang Filipino sa iba't ibang kategorya.

Mga Kalahok sa Pag-aaral

Ang mga guro sa Filipino sa Isabela National High School ang gagamiting kalahok sa isasagawang pananaliksik. Purposive Sampling ang gagamitin upang sa pagtukoy ng bilang ng magiging respondante ng pag-aaral.

Talahanayan 1. Distribusyon ng Guro

Paaralan	Bilang ng Kalahok	Bahagdan
Isabela National High School	25	100

Lokasyon ng Pag-aaral

Ang Dibisyon ng City of Ilagan, Isabela ay isang lungsod sa rehiyon ng Lambak ng Cagayan sa hilagang bahagi ng Luzon, Pilipinas. Itinatag ang nasabing dibisyon noong 2013. Ang lungsod ay mayroong mahigit 60 pampublikong paaralan sa elementarya at sekondarya. Partikular na isasagawa sa Isabela National High School na matatagpuan sa Claravall St. San Vicente, City of Ilagan, Isabela.

Instrumentong Ginamit sa Pananaliksik

Ang mananaliksik ay gagamit ng talatanungan o survey questionnaire bilang pangunahing instrumento sa pagkalap ng mga datos na magagamit sa pag-aaral. Ang talatanungan ay nahahati sa dalawang pangkat: ang propayl ng mga guro at ang survey o talatanungan tungkol sa paksang pinag-aaralan.

Ang mga tanong sa talatanungan ay nakaangkla sa mga pag-aaral na tumutukoy sa epekto ng wika sa akademikong pag-unlad, na may layuning masuri kung paano nakatutulong ang wika sa mga kakayahan ng mga mag-aaral sa loob ng silid-aralan at sa kanilang pang-araw-araw na buhay. Ang nabuong talatanungan ay dumaan sa balidasyon ng mga gurong mayroong mataas na kaalaman at karanasan sa larangan ng wika at edukasyon upang tiyak na masuri ang nilalaman, kalinawan, at kaugnayan ng mga tanong o indiketyor sa talatanungan. Dumaan din sa pilot testing upang masuri ang validity at reliability nito at matiyak na angkop ito para sa target na respondente, na lahat ay makatutulong upang makuha ang mas maayos at tumpak na resulta sa aktwal na pananaliksik.

Ginamit ang Cronbach's Alpha upang malaman kung magkakaugnay at consistent ang mga tanong sa pagsusukat ng iisang konsepto. Tinanggap na reliable ang talatanungan dahil ang lumabas na Cronbach's Alpha ay 0.966 o mas mataas.

Pamamaraan ng Pagkalap ng mga Datos

Isasagawa ng mananaliksik ang mahahalagang hakbang upang malikom ang mga kinakailangang datos at impormasyon na may kaugnayan sa pag-aaral na ito.

Hihingi ng pormal na pahintulot sa Schools Division Superintendent at mga Punongguro ng Isabela National High School upang magsagawa ng pananaliksik sa kahalagahan ng wikang Filipino. Kapag mabigyan ng pahintulot, ipamamahagi ang mga talatanungan sa mga respondente upang mangalap ng datos sa kanilang mga pananaw sa pagpapahalaga ng wikang Filipino sa iba't ibang konteksto.

Instrumentong Pang-istadistika

Pangunahing ginamit sa pangangalap ng datos ay talatanungan. Ginamit ng mananaliksik ang mga sumusunod upang masuri ang mga datos:

Frequency Count o Percentage. Gagamitin ito upang matukoy ang profayl ng mga guro batay sa kanilang edad, kasarian, unang wika, antas ng natapos na edukasyon, at bilang ng taon sa pagtuturo ng asignaturang Filipino.

Mean. Ang ebalwasyon ng mga guro sa bawat antas ng pagpapahalaga sa wikang Filipino sa kategoryang pormal na konteksto, sosyal na konteksto, midyum sa pagtuturo, at asignatura sa batayang edukasyon ay bibigyan ng interpretasyon gamit ang mean ng kanilang ebalwasyon.

Magiging gabay ang mga sumusunod na iskala at deskripsyon

Mean	Pagpapakahulugan	Kaukulang Paglalarawan
3.50-4.0	Lubos na Sumasang-ayon	Lubos na Mahalaga
2.50-3.49	Sumasang-ayon	Mahalaga
1.50-2.49	Hindi sumasang-ayon	Mababang Kahalagahan
1.0-1.49	Lubos na Hindi Sumasang-ayon	Napakababang Kahalagahan

RESULTA

A. Profayl ng mga Guro

Talahanayan 1. Profayl ng mga Guro

Profayl	Frequency (n = 25)	Percent (100.0)
Edad		
20-30	11	44.0
31-40	9	36.0
51-60	5	20.0
Kasarian		
Babae	19	76.0
Lalaki	6	24.0
Unang Wika		
Iloko	10	40.0
Tagalog	7	28.0
Ibanag	8	32.0
Antas na Natapos		
College Graduate	6	24.0
With Master's Unit	10	40.0
Master's Graduate	9	36.0
Bilang ng Taon sa Pagtuturo ng Asignaturang Filipino		
1-5	15	60.0
6-10	6	24.0
11-15	4	16.0

Makikita sa Talahanayan 1 ang profayl ng mga guro batay sa edad, kasarian, unang wika, antas ng natapos at bilang ng taon sa pagtuturo. Ang kabuong bilang ay 25. Batay sa edad, karamihan sa mga tagatugon ay nasa edad 20 – 30 (44%). Habang ang mga nasa edad 31 – 40 ay may bilang na 9 (36%). Samantala, kaunti lamang sa mga tagatugon ang may edad 51 – 60 na may bilang na 5 (20%). Batay sa kasarian, makikita na mas marami ang mga tagatugon na babae 19 (76%) habang ang mga tagatugong lalaki naman ay 6 (24%). Batay sa unang wika, makikita na pinakarami sa mga tagatugon ay Iloko na may bilang na 10 (40%). Habang, ang mga guro ng Ibanag ay may bilang na 8 (32%). Samantala, ang mga tagatugon na Tagalog ay may bilang na 7 (28%). Batay sa antas ng natapos, karamihan sa mga tagatugon ay with master's unit na may bilang na 10 (40%). Samantala, 9 (36%) sa mga tagatugon ay master's graduate. Habang 6 (24%) naman ang college graduate. Batay sa bilang ng taon sa pagtuturo ng asignaturang Filipino, marami sa mga tagatugon ang nasa 1-5 taon na may bilang na 15 (60%). Habang ang nasa 6-10 taon ay may bilang na 6 (24%). Samantala, kaunti lamang ang 11-15 na taon na may bilang na 4 (16%).

B. Antas ng Pagpapahalaga sa Wikang Filipino batay sa Persepsyon ng mga Guro

Pormal na Konteksto

Talahanayan 2. Antas ng Pagpapahalaga sa Wikang Filipino batay sa Persepsyon ng mga Guro sa Kategoryang Pormal na Konteksto

Pormal na Konteksto	Guro	
	Mean	DE
Ang wikang Filipino ay mahalagang magsilbing pundasyon ng pagkakaisa ng ating bansa, nag-uugnay sa iba't ibang kultura at rehiyon.	4.00	Lubos na Mahalaga
Bilang wikang opisyal, mahalagang ang Filipino ang gamitin sa lahat ng opisyal na komunikasyon ng pamahalaan upang mapalakas ng transparency at inclusivity.	4.00	Lubos na Mahalaga
Sa mga legal na proseso, mahalagang ang Filipino ay gamitin sa mga batas, kasunduan, at mga usapin sa hukuman.	3.88	Lubos na Mahalaga
Sa akademya, ang Filipino ay mahalagang gamitin sa mga pananaliksik, pagsulat ng tesis, at iba pang intelektuwal at akademikong gawain.	3.88	Lubos na Mahalaga
Mahalagang nakasulat sa Filipino ang mga patakaran sa edukasyon upang maunawaan ng mas nakararami.	3.96	Lubos na Mahalaga
Mahalagang ang ating kasaysayan ay nakapaloob sa mga dokumento na nakasulat sa Filipino, na nagsisilbing tala ng ating nakaraan.	3.88	Lubos na Mahalaga
Kahit sa larangan ng agham, ang Filipino ay mahalagang gamitin sa pagsulat ng mga artikulo at pagbabahagi ng mga natuklasan.	3.92	Lubos na Mahalaga
Ang Filipino ay mahalaga at susi sa pag-iingat at pagpapalaganap ng ating kultura at tradisyon.	3.96	Lubos na Mahalaga
Sa larangan ng negosyo, ang Filipino ay mahalaga sa mga transaksyon, kontrata, at iba pang opisyal na dokumento.	3.92	Lubos na Mahalaga
Tinitiyak na ang mga mamamayan ay makakakuha sa mga serbisyo ng gobyerno sa tulong ng paggamit ng wikang Filipino sa mga opisyal na diskurso.	3.96	Lubos na Mahalaga

Legend: 3.50-4.00 = Lubos na Mahalaga; 2.50-3.49 = Mahalaga

Batay sa talahanayan 2, makikita na lubos na pinahahalagahan ng mga guro ang wikang Filipino sa kategoryang pormal na konteksto sa indikaytor na ang wikang Filipino ay mahalagang magsilbing pundasyon ng pagkakaisa ng ating bansa, nag-uugnay sa iba't ibang kultura at rehiyon, bilang wikang opisyal, mahalagang ang Filipino ang gamitin sa lahat ng opisyal na komunikasyon ng pamahalaan upang mapalakas ng transparency at inklusivity na may parehong mean na 4.00 at ang indikaytor na ang Filipino ay mahalaga at susi sa pag-iingat at pagpapalaganap ng ating kultura at tradisyon na may mean na 3.96.

Samakatuwid, malinaw na lubos na pinahahalagahan ng mga guro ang wikang Filipino sa pormal na konteksto, lalo na bilang instrumento ng pagkakaisa, opisyal na komunikasyon, at tagapagdala ng kultura. Dahil dito, mahalagang isaalang-alang sa pagtuturo ng asignaturang Filipino sa sekondarya ang pagpapalalim ng kaalaman ng mga mag-aaral sa papel ng wika sa lipunan.

Sosyal na Konteksto

Talahanayan 3. Antas ng Pagpapahalaga sa Wikang Filipino batay sa Persepsyon ng mga Guro sa Kategoryang Sosyal na Konteksto

Sosyal na Konteksto	Guro	
	Mean	DE
Ang paggamit ng Filipino sa pang-araw-araw na buhay ay nagpapalawak ng ating kaalaman at nagpapayaman sa ating pagkatao.	3.96	Lubos na Mahalaga
Mahalagang ang Filipino ang pangunahing wika na ginagamit natin sa pang-araw-araw na pakikipag-usap sa pamilya, kaibigan, at iba pang kakilala.	3.96	Lubos na Mahalaga
Sa loob ng pamilya at sa pakikipag-ugnayan sa iba, mahalaga ang Filipino sa pagpapalakas ng mga relasyon at pagbibigay daan sa mas malalim na pag-unawa sa isa't isa.	3.96	Lubos na Mahalaga
Ang social media at iba pang online platform ay mahalagang magsilbing tsanel ng mga usapang Filipino, na nag-uugnay sa mga tao saan mang sulok ng mundo.	3.88	Lubos na Mahalaga
Sa pakikilahok sa komunidad, mahalaga ang Filipino upang magsilbing tulay sa pagkakaisa at pagtutulungan para sa ikabubuti ng lahat.	3.96	Lubos na Mahalaga
Sa anumang relihiyon sa Pilipinas, mahalaga ang paggamit ng Filipino sa mga ritwal at pagsamba upang mapatibay ang pananampalataya.	3.92	Lubos na Mahalaga
Sa pulitika, ang Filipino ay mahalagang gamitin upang ipahayag ang mga opinyon at saloobin ng mga mamamayan.	3.92	Lubos na Mahalaga
Ang mga adhikain para sa pagbabago sa lipunan ay mas epektibong naipahahayag sa pamamagitan ng Filipino.	3.96	Lubos na Mahalaga
Sa pamamagitan ng Filipino, mas nauunawaan natin ang iba't ibang kultura at tradisyon ng ating bansa, na nagpapayaman sa ating pagkakakilanlan at pakikipagkapwa.	3.88	Lubos na Mahalaga
Ang sining at libangan, tulad ng musika, pelikula, at literatura, ay mas napahahalagahan kapag naiintindihan ang mga salitang ginagamit dito tulad ng Filipino.	3.88	Lubos na Mahalaga

Legend: 3.50-4.00 = Lubos na Mahalaga; 2.50-3.49 = Mahalaga

Batay sa talahanayan 3, makikita na lubos na pinahahalagahan ng mga guro ang wikang Filipino sa kategoryang sosyal na konteksto ang mga indikaytor na ang paggamit ng Filipino sa pang-araw-araw na buhay ay nagpapalawak ng kaalaman at nagpapayaman sa pagkatao. Gayundin, ang wikang Filipino bilang pangunahing wika ay ginagamit sa pang-araw-araw na pakikipag-usap sa pamilya, kaibigan, at iba pang kakilala upang mapatibay ang mga relasyon at nagbibigay-daan ito sa mas malalim na pag-unawa sa isa't isa na may parehong mean na 3.96. Kung gayon, malinaw na lubos na pinahahalagahan ng mga guro ang wikang Filipino sa sosyal na konteksto, lalo na sa nagpapalawak ng kaalaman, nagpapayaman ng pagkatao, at pagpapatibay ng ugnayan sa kapwa. Samantala, ipinapakita na mahalaga ang Filipino sa pang-araw-araw na pakikipag-ugnayan, kaya't ang pagtuturo ng asignaturang Filipino sa sekondarya ay dapat magbigay-diin sa gamit ng wika sa tunay na buhay—sa tahanan, paaralan, at komunidad.

Midyum sa Pagtuturo

Talahanayan 4. Antas ng Pagpapahalaga sa Wikang Filipino batay sa Persepsyon ng mga Guro sa Kategoryang Midyum sa Pagtuturo

Midyum sa Pagtuturo	Guro	
	Mean	DE
Ang Filipino ay isang epektibong midyum para sa paglinang ng mga kasanayan sa wika, lalo na sa mga batang nagsisimula pa lamang matuto.	3.96	Lubos na Mahalaga
Ang paggamit ng Filipino ay nagpapadali sa pag-unawa ng mga konsepto sa akademya, na nagreresulta sa mas mataas na tagumpay ng mga mag-aaral.	3.96	Lubos na Mahalaga
Sa pamamagitan ng paggamit ng Filipino bilang midyum ng pagtuturo, mas nauunawaan ng mga mag-aaral ang kanilang kultura at kasaysayan.	3.96	Lubos na Mahalaga
Ang pagiging bihasa sa Filipino ay nagbibigay sa mga mag-aaral ng kalamangan sa pandaigdigang kompetisyon.	3.80	Lubos na Mahalaga
Ang paggamit ng Filipino sa edukasyon ay tumutulong sa pag-iingat at pagpapalaganap ng mga kaalaman at kaugalian ng bawat lokalidad.	3.96	Lubos na Mahalaga
Ang pag-aaral sa pamamagitan ng Filipino ay nagtataguyod ng malalim na pag-iisip at pagsusuri ng mga impormasyon.	3.96	Lubos na Mahalaga
Ang paglutas ng mga problema ay mas madali kapag ginagamit ang Filipino bilang midyum ng pag-aaral.	3.96	Lubos na Mahalaga
Ang paggamit ng Filipino ay nagbibigay-daan sa mga mag-aaral na maging malikhain at makabuo ng mga makabagong ideya.	3.96	Lubos na Mahalaga
Ang Filipino ay nagsisilbing tulay upang maabot ang lahat ng mga mag-aaral, anumang kanilang background o kakayahan.	3.84	Lubos na Mahalaga
Ang mga kasanayan sa pamumuno (leadership) ay mas nabubuo kapag ang mga mag-aaral ay nakikilahok sa mga talakayan at proyekto na gumagamit ng Filipino.	3.92	Lubos na Mahalaga
Ang pagiging bihasa sa Filipino ay nagbubukas ng maraming oportunidad para sa patuloy na pag-aaral at pag-unlad.	3.92	Lubos na Mahalaga

Legend: 3.50-4.00 = Lubos na Mahalaga; 2.50-3.49 = Mahalaga

Batay sa talahanayan 4, mataas ang pagpapahalaga ng mga guro sa Wikang Filipino batay sa kategoryang midyum sa pagtuturo sa mga indikador na sa pamamagitan ng paggamit ng Filipino bilang midyum ng pagtuturo, mas nauunawaan ng mga mag-aaral ang kanilang kultura at kasaysayan. Pinaniniwalaan ng mga guro na ang paggamit ng Filipino sa edukasyon ay tumutulong sa pag-iingat at pagpapalaganap ng mga kaalaman at kaugalian ng bawat lokalidad at nagbibigay-daan sa mga mag-aaral na maging malikhain at makabuo ng mga makabagong ideya na may parehong mean na 3.96. Sa kabilang dako, malinaw na mataas ang pagpapahalaga ng mga guro sa wikang Filipino bilang midyum ng pagtuturo, lalo na sa papel nito sa pagpapalalim ng pag-unawa ng mga mag-aaral sa kanilang kultura, kasaysayan, at malikhaing pag-iisip. Ipinahihiwatig nito na may malakas na paniniwala ang mga guro na ang paggamit ng wikang Filipino sa klase ay hindi lamang nakatutulong sa pagpapadali ng pagkatuto kundi nagsisilbing daluyan ng identidad at inobasyon. Ang ganitong pananaw ay may positibong implikasyon sa pagtuturo ng Filipino sa sekondarya, dahil ipinapakita nitong handa ang mga guro na yakapin ang wika bilang kasangkapan ng makabuluhang edukasyon.

Asignatura sa Batayang Edukasyon

Talahanayan 5. Antas ng Pagpapahalaga sa Wikang Filipino batay sa Persepsyon ng mga Guro at Mag-aaral sa Kategoryang Asignatura sa Batayang Edukasyon

Asignatura sa Batayang Edukasyon	Guro	
	Mean	DE
Ang asignaturang Filipino ay nagsisilbing pundasyon sa paglinang ng malawak at wastong paggamit ng wika.	3.88	Lubos na Mahalaga
Sa pamamagitan ng pag-aaral ng Filipino, natututo ang mga mag-aaral na suriin ang mga impormasyon at bumuo ng sariling opinyon.	3.96	Lubos na Mahalaga
Ang pag-aaral ng Filipino ay nagpapalakas ng pambansang pagkakakilanlan at pagmamahal sa sariling bayan.	3.96	Lubos na Mahalaga
Ang mga kasanayang natutunan sa pag-aaral ng Filipino ay magagamit sa pang-araw-araw na buhay.	3.96	Lubos na Mahalaga
Ang Filipino ay nagtuturo sa mga mag-aaral ng epektibong paraan ng pakikipag-usap, kapwa pasalita at pasulat.	3.96	Lubos na Mahalaga
Ang pag-aaral ng Filipino ay nagpapahusay sa kakayahang umunawa sa mga binabasa.	3.96	Lubos na Mahalaga
Ang asignaturang Filipino ay nagtuturo sa mga mag-aaral na magsulat ng malinaw at organisadong mga sulatin.	3.96	Lubos na Mahalaga

Ang Filipino ay nagpapaunlad ng kasanayan sa pagsasalita sa harap ng maraming tao.	3.96	Lubos na Mahalaga
Ang pag-aaral ng panitikan sa Filipino ay nagtuturo sa mga mag-aaral na pahala-gahan ang mga gawa ng ating mga manunulat.	3.96	Lubos na Mahalaga
Sa pamamagitan ng pag-aaral ng kasaysayan sa Filipino, mas nauunawaan natin ang ating pinagmulan at kung paano tayo nakarating sa kasalukuyan.	4.00	Lubos na Mahalaga
Ang pag-aaral ng Filipino ay nag-aambag sa holistic development ng isang indibidwal.	3.96	Lubos na Mahalaga
Nagpapadali ng ugnayan sa pagitan ng wika at iba pang asignatura, tulad ng araling panlipunan.	3.96	Lubos na Mahalaga
Nagbibigay kapangyarihan sa mga estudyante sa pamamagitan ng pagpayag na ipahayag ang kanilang mga saloobin at paniniwala.	3.96	Lubos na Mahalaga

Legend: 3.50-4.00 = Lubos na Mahalaga; 2.50-3.49 = Mahalaga

Batay sa talahanayan 5, mataas ang pagpapahalaga ng mga guro sa Wikang Filipino batay sa kategoryang asignatura sa batayang edukasyon sa mga indikektor na ang mga kasanayang natutunan sa pag-aaral ng Filipino ay magagamit sa pang-araw-araw na buhay, ang Filipino ay nagtuturo sa mga mag-aaral ng epektibong paraan ng pakikipag-usap, kapwa pasalita at pasulat, ang pag-aaral ng Filipino ay nagpapahusay sa kakayahang umunawa sa mga binabasa at ang Filipino ay nagpapaunlad ng kasanayan sa pagsasalita sa harap ng maraming tao na may mean na 3.96. Sa kabilang dako, nagpapahiwatig na lubos na pinahahalagahan ng mga guro ang Wikang Filipino bilang asignatura sa batayang edukasyon. Ipinapakita nito na kinikilala nila ang malaking papel ng Filipino sa paghubog ng mga kasanayang komunikatibo, pag-unawa sa binabasa, at pagsasalita sa harap ng maraming tao.

KONKLUSYON

1. Batay sa profayl ng mga guro, kadalasan ay kabataan, nasa edad 20–30, at karamihan ay kababaihan. Mas maraming guro ang may Iloko bilang unang wika, na nagpapakita ng impluwensya ng rehiyonal na wika sa pagtuturo. Sa kabila ng pagiging bata ng karamihan sa mga tagatugon, makikita ring mataas ang kanilang kwalipikasyon dahil marami sa kanila ay may master's units o master's degree.
2. Malinaw na lubos na pinahahalagahan ng mga guro ang wikang Filipino sa pormal na konteksto, lalo na sa papel nito bilang pundasyon ng pambansang pagkakaisa, opisyal na midyum ng komunikasyon, at tagapangalaga ng kultura.
3. Ang wikang Filipino ay lubos na pinahahalagahan ng mga guro sa sosyal na konteksto bilang mahalagang kasangkapan sa pagpapalawak ng kaalaman, paghubog ng pagkatao, at pagpapatibay ng ugnayan sa kapwa.
4. Mataas ang pagpapahalaga ng mga guro sa wikang Filipino bilang midyum ng pagtuturo, partikular sa papel nito sa pagpapalalim ng pag-unawa sa kultura, kasaysayan, at malikhaing pag-iisip ng mga mag-aaral.
5. Lubos na pinahahalagahan ng mga guro ang Wikang Filipino bilang asignatura sa batayang edukasyon, kinikilala ng mga guro ang mahalagang papel ng Filipino sa paglinang ng mga kasanayang komunikatibo, kakayahang umunawa sa binabasa, at kahusayan sa pagsasalita sa harap ng publiko.

REKOMENDASYON

1. Maglunsad ng mas maraming seminar at pagsasanay para sa mga batang guro upang higit pang mapalawak ang kanilang kaalaman sa makabago at makabuluhang estratehiya sa pagtuturo ng Filipino, lalo na't marami sa kanila ay nasa unang yugto pa lamang ng kanilang propesyon.
2. Palakasin ang integrasyon ng wikang Filipino sa mga opisyal na komunikasyon sa paaralan at pamahalaan, upang mahubog sa mga mag-aaral at guro ang patuloy na paggamit ng wika bilang instrumento ng pambansang pagkakaisa at pagkakaunawaan.
3. Isama sa kurikulum ng Filipino ang mga kontemporaryong isyung panlipunan at mga lokal na kultura upang lalong mapaunlad ng mga mag-aaral ang kanilang pagkatao, pagpapahalaga sa sarili, at ugnayan sa kapwa sa pamamagitan ng wika.

4. Gamitin ang Filipino bilang pangunahing midyum sa mga interdisiplinaryong aralin, upang mai-pakita ang kakayahan nitong maging daluyan ng malalim na pag-unawa, malikhaing pag-iisip, at intelektuwal na diskurso sa iba't ibang larangan.
5. Gumawa ng mga programang nakatuon sa pagpapalawak ng kasanayang komunikatibo ng mga mag-aaral, tulad ng debate, spoken poetry, at pananaliksik gamit ang Filipino, upang higit na mahubog ang kanilang kakayahang magsalita at umunawa.
6. Suportahan ang pagbuo ng mga kagamitang panturo na nakasentro sa kultura, kasaysayan, at wika ng rehiyon, gaya ng Iloko o Ibanag, upang mapalalim ang pag-unawa ng mga mag-aaral sa koneksyon ng wikang Filipino sa kanilang lokal na identidad.

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GAWI AT KASANAYAN SA GRAMATIKA SA MGA IMPORMAL NA DIGITAL NA DISKURSO NG MGA MAG-AARAL SA SEKONDARYA: IMPLIKASYON SA PAGPAPABUTI SA PAGTUTURO NG ASIGNATURANG FILIPINO

GRAMMAR HABITS AND SKILLS IN INFORMAL DIGITAL DISCOURSE OF SECONDARY STUDENTS: IMPLICATIONS FOR IMPROVING THE TEACHING OF THE FILIPINO SUBJECT

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ABSTRACT

Ang pag-aaral na ito ay naglalayong suriin ang gawi at kasanayang panggramatika ng mga mag-aaral sa sekondarya sa kanilang impormal na digital na diskurso, partikular sa mga platformang gaya ng social media, messaging apps, at iba pang online na midyum ng komunikasyon. Layunin nitong matukoy ang mga madalas na ginagamit na estruktura ng wika, mga anyo ng pagbabalangkas ng mensahe, at mga salik na nakaaapekto sa kanilang paggamit ng wikang Filipino sa di-pormal na konteksto. Gumamit ang mananaliksik ng kwalitatibo at deskriptibong metodolohiya sa pangangalap ng datos mula sa mga aktwal na palitan ng mensahe ng mga mag-aaral at panayam sa piling kalahok. Lumabas sa pag-aaral na bagaman may paglihis sa pormal na gramatika, ang impormal na digital na diskurso ay nagpapakita ng malikhaing paggamit ng wika, na may implikasyon sa kakayahang komunikatibo ng mga mag-aaral. Mula rito, inirerekomenda ang integrasyon ng mga kontemporaryong anyo ng komunikasyon sa pagtuturo ng asignaturang Filipino upang mas maging makabuluhan at kontekstuwal sa mga mag-aaral ang pagkatuto ng wika.

Keywords: gramatika, impormal na diskurso, digital na komunikasyon, sekondarya, wikang Filipino

This study aims to examine the grammatical habits and skills of secondary students in their informal digital discourse, particularly on platforms such as social media, messaging apps, and other online communication media. It seeks to identify commonly used language structures, message construction patterns, and factors influencing their use of the Filipino language in informal contexts. The researcher employed qualitative and descriptive methodologies in collecting data from actual message exchanges and interviews with selected participants. The study revealed that while there are deviations from formal grammar, informal digital discourse demonstrates creative language use, which has implications for students' communicative competence. Based on the findings, the integration of contemporary forms of communication into the teaching of the Filipino subject is recommended to make language learning more meaningful and contextualized for students.

Keywords: grammar, informal discourse, digital communication, secondary, Filipino language

PANIMULA

Sa kasalukuyang panahon ng mabilis na teknolohikal na pagbabago, ang digital literacy o kakayahang gumamit ng mga digital na kasangkapan at mapagkukunan ay nagiging mahalagang aspeto ng edukasyon. Sa larangan ng pagtuturo, lalo na sa asignaturang Filipino, ang digital literacy ay may malaking papel sa pagpapabuti ng pamamaraan ng pagtuturo at pagkatuto. Ang kakayahang gumamit ng teknolohiya ay hindi lamang nagbibigay-daan sa mas malikhaing at interaktibong pamamaraan ng pagtuturo kundi tumutulong din sa mga guro na makasabay sa mga makabagong pamamaraan ng edukasyon.

Sa pagtuturo ng Filipino, mahalaga ang paggamit ng teknolohiya upang mapalaganap ang mas malawak na kaalaman sa wika, kultura, at panitikan. Gayunpaman, nananatiling isang hamon ang pagsasama ng digital literacy sa tradisyunal na paraan ng pagtuturo. Ang kakulangan sa kagamitan, kaalaman, at suporta ay ilan lamang sa mga balakid na nararanasan ng mga guro. Sa kabila nito, maraming posibilidad ang naibubukas ng digital literacy para mapabuti ang kalidad ng edukasyon sa Filipino.

Sa konteksto ng Pilipinas, kung saan ang wika at kultura ay mayaman at magkakaiba, ang asignaturang Filipino ay may mahalagang papel sa pagbuo ng pambansang pagkakakilanlan at pagpapahalaga sa lokal na kultura. Gayunpaman, ang pag-usbong ng digital na teknolohiya ay nagdala ng mga pagbabago sa paraan ng paggamit ng wika. Maraming kabataan ang nahuhumaling sa mga mas mabilis at mas magaan na paraan ng komunikasyon, na kadalasang nagreresulta sa paggamit ng mga salitang pinaikli, mga emoji, at iba pang anyo ng hindi pormal na wika. Sa isang pag-aaral ni Reyes (2022), tinalakay ang mga estratehiya sa pagtuturo ng gramatika sa konteksto ng digital na komunikasyon at ipinakita na ang paggamit ng mga interactive na gawain ay nakatulong sa pagpapabuti ng kasanayan sa gramatika ng mga mag-aaral.

Ayon sa isang pag-aaral, ang labis na pag-asa sa mga shortcut at informal na wika sa online na interaksyon ay nagresulta sa paglitaw ng mga pagkakamali sa gramatika at pagbawas ng pormal na kasanayan sa pagsulat ng mga mag-aaral (Santos at De Vera, 2021). Ayon sa isang pag-aaral nina Cruz at Lopez (2023), ang mga mag-aaral na may mataas na antas ng digital literacy ay mas mahusay sa paggamit ng wastong gramatika kumpara sa mga hindi pamilyar sa mga digital na platform. Ito ay nagbigay-diin sa kahalagahan ng digital literacy sa pagbuo ng kasanayan sa wika, na nagiging mahalaga sa kanilang akademikong pag-unlad. Samantalang sa isang pag-aaral ni Villanueva (2022), na nagbigay-diin sa mga pagbabago sa wika dulot ng digital na komunikasyon, ipinakita ang pag-uso ng colloquial at informal na wika sa online na interaksyon na nagiging sanhi ng pag-aalala sa tamang paggamit ng gramatika.

Bilang karagdagan, ang pag-unawa sa mga pagkukulang at kalakasan ng mga mag-aaral sa gramatika ay mahalaga hindi lamang para sa kanilang akademikong pag-unlad kundi pati na rin sa kanilang pagiging epektibong tagapagkomunikasyon sa digital na mundo. Sa isang lipunan kung saan ang komunikasyon ay kadalasang nangyayari sa online na kapaligiran, ang kakayahang gumamit ng tamang gramatika ay nagiging mahalaga upang maipahayag ang mga ideya nang malinaw at epektibo. Ang pagkakaroon ng solidong pundasyon sa gramatika ay hindi lamang makatutulong sa mga mag-aaral sa kanilang mga asignatura kundi makatutulong din sa kanilang pang-araw-araw na buhay, lalo na sa kanilang pakikipag-ugnayan sa iba.

Ang pananaliksik na ito ay naglalayong suriin ang gawi at kasanayan ng mga mag-aaral sa sekondarya sa paggamit ng gramatika sa mga impormal na digital na diskurso. Layunin nitong alamin ang kaugnayan ng kanilang mga digital na gawi sa kanilang akademikong pagganap, partikular sa asignaturang Filipino. Sa pamamagitan nito, mabibigyang-diin ang mga implikasyon ng naturang gawi sa pagpapabuti ng pagtuturo ng Filipino, lalo na sa aspeto ng gramatika. Ang resulta ng pag-aaral na ito ay makatutulong sa pagbibigay ng mas angkop na estratehiya at interbensyon sa pagtuturo, upang mas mapataas ang kasanayan ng mga mag-aaral sa wika sa parehong digital at tradisyunal na konteksto.

PAGLALAHAD NG SULIRANIN

Ang pag-aaral na ito ay may layuning matukoy ang gawi at antas ng kasanayan sa gramatika sa mga impormal na digital na diskurso ng mga mag-aaral at implikasyon nito sa pagpapabuti sa pagtuturo ng asignaturang Filipino. Sasagutin sa pag-aaral na ito ang sumusunod na mga tanong:

1. Ano ang gawi ng mga mag-aaral hinggil sa mga digital na diskurso batay sa mga sumusunod:

1.1 pagsulat ng diskurso; at

- 1.2 pagbabasa ng diskurso?
2. Ano ang antas ng kasanayan ng mga mag-aaral sa gramatikang Filipino sa mga impormal na digital na diskurso sa mga sumusunod:
 - 2.1 pagkilala sa mali;
 - 2.2 kontekstwal na gramatika;
 - 2.3 gramatikong pagpapaliwanag?
3. Ano ang kaugnayan ng gawi at antas ng kasanayan sa gramatikang Filipino sa mga impormal na digital na diskurso ng mga mag-aaral?

METODO

Disenyo ng Pananaliksik

Sa paglalahad at pagsusuri sa mga nakalap na datos, gagamit ang mananaliksik ng **deskriptiv-komparativ at korelasyon** na pag-aaral na gagamit ng qualitative na pamamaraan ng pagsusuri ng datos.

Mga Kalahok sa Pag-aaral

Ang magiging respondente sa pananaliksik na ito ay mga mag-aaral sa Junior High School ng San Jose National High School sapagkat sila ang mag-aaral na sangkot sa pananaliksik na nakuha gamit ang Stratified Random Sampling.

Talahanayan 1. Distribusyon ng mga kalahok sa pag-aaral

Baitang (Grade)	Samples
Grade 7	48
Grade 8	47
Grade 9	46
Grade 10	43
Grade 11	56
Grade 12	44
Kabuuan	284

Lokasyon ng Pag-aaral

Ang pananaliksik na ito ay isasagawa sa paaralan ng San Jose National High School. Isang malaking paaralan ng sekondarya na matatagpuan sa Brgy. San Jose Norte 1, bayan ng Mallig, lalawigan ng Isabela.

Instrumentong Ginamit sa Pangangalap ng mga Datos

Talatanungan at Pagsusulit. Gagamit ang mananaliksik ng gawang gurong talatanungan at pagsusulit hinggil sa gawi at kasanayan sa gramatika sa mga impormal na digital na diskurso ng mga mag-aaral sa sekondarya. Ang unang bahagi ay ang profayl ng mga mag-aaral. Ang ikalawang bahagi ay talatanungan ukol sa gawi ng mga mag-aaral hinggil sa mga digital na diskurso batay sa pagsulat ng diskurso at pagbabasa ng diskurso. Ang ikatlong bahagi ay hinggil sa kasanayan sa gramatika sa mga impormal na digital na diskurso ng mga mag-aaral, gumawa ng pagsusulit na base sa mga post sa Facebook at Tiktok na mataas ang engagement na nahati sa tatlong bahagi:

1. **Pagkilala sa Mali** - tukuyin ang bahaging mali sa pahayag mula sa mga posts sa Facebook at Tiktok na mataas ang engagement na may 15 na aytems.
2. **Kontekstwal na Gramatika** - piliin mula sa mga pagpipilian ang wastong salita o pariral na angkop sa konteksto ng mga pahayag na hango sa mga posts sa Facebook at Tiktok na mataas ang engagement na may 15 na aytems.
3. **Gramatikong Pagpapaliwanag** - piliin mula sa mga pagpipilian ang wastong sagot at paliwanag ng mga tanong mula sa mga posts sa Facebook at Tiktok na mataas ang engagement na may 15 na aytems.

Ang gawang-gurong pagsusulit ay pinatunayan ng isang guro sa Filipino na nagtuturo sa sekondarya kasama ang tagapayo ng mananaliksik. Sa paglalarawan ng kanilang performans sa antas ng kasanayan

ng mga mag-aaral sa gramatikang Filipino sa mga impormal na digital na diskurso, gagamitin ang eskala sa ibaba.

Nakuhang Iskor	Descriptive Rating
1-3	Napakababa ang kasanayan
4-6	Mababa ang kasanayan
7-10	Katamtaman ang kasanayan
11-15	Mataas ang kasanayan

Grade Sheet. Gagamitin ang Grade Sheet sa Filipino sa Una at Ikalawang Quarter upang makita ang wastong grado ng mga mag-aaral.

RESULTA

A. Gawi ng mga Mag-aaral higgil sa mga Digital na Diskurso

Talahanayan 1. Gawi ng mga Mag-aaral higgil sa mga Digital na Diskurso batay sa Pagsulat ng Diskurso at Pagbabasa ng Diskurso

Pagsulat ng Mensahe para sa Social Media	Mean	Descriptive Equivalent
Sinisiguro kong tama ang gramatika bago ipost at i-comment ang mensahe	4.33	Paminsan-minsan
Sinisiguro kong tama ang ispelang ng mga salita bago ipost at ilagay sa comment section ang mensahe	4.29	Paminsan-minsan
Gumagamit ako ng mga acronyms katulad ng lol, pov at atm	3.26	Kung Kinakailangan
Gumagamit ako ng mga abbreviations katulad ng LOL	3.11	Kung Kinakailangan
Gumagamit ako ng mga neologism o makabagong salita katulad ng Marites, omsim, truepa at iba pa.	3.43	Kung Kinakailangan
Gumagamit ako ng AI sa pagbuo ng mensahe	2.93	Kung Kinakailangan
Pinaiikli o kinakaltasan ko ng letra ang mga salita katulad ng “mhal m b ako”	2.60	Kung Kinakailangan
Hindi ako sigurado sa gramatika sa pagbuo ng mensahe	2.97	Kung Kinakailangan
Gumagamit ako ng purong Tagalog	3.39	Kung Kinakailangan
Gumagamit ako ng purong Ingles	3.07	Kung Kinakailangan
Gumagamit ako ng Taglish (magkasamang Tagalog at Ingles)	3.58	Paminsan-minsan
Pagbabasa ng mga Mensahe sa Social Media		
Pinapansin ko ang mga maling ispelang ng mga salitang nababasa sa mga posts at comments	3.59	Paminsan-minsan
Pinapansin ko ang maling gramatika ng mga mensahe sa mga posts at comments	3.47	Kung Kinakailangan
Sinasabihan ko na mali ang ispelang at gramatika ng nagpost at nagcomment sa publiko	2.35	Bihira
Sinasabihan ko na mali ang ispelang at gramatika ng nagpost at nagcomment sa pamamagitan ng private message	2.28	Bihira
Itinatama ko ang ispelang at gramatika ng mensahe sa isip ko lamang	3.83	Paminsan-minsan
Itinatama ko ang ispelang at gramatika ng mensahe at ilalagay sa comment section	2.58	Kung Kinakailangan
Hinahayaan ko na lamang ang mga maling ispelang at gramatika basta naiintindihan ko ang mensahe	3.24	Kung Kinakailangan
Nagbibigay ako ng negatibong reaksiyon gaya ng (sad at angry emoji) sa mga mensaheng may maling ispelang at gramatika	2.38	Bihira

Legend: 1.50-2.49 = Bihira; 2.50-3.49 = Kung Kinakailangan; 3.50-4.49 = Paminsan-minsan

Pagsulat ng Mensahe sa mga Social Media. Makikita sa talahanayan 1 ang gawi ng mga mag-aaral sa pagsulat ng mensahe para sa mga social media. Paminsan-minsan sinisiguro ng mga mag-aaral na tama ang gramatika bago ipost at icomment ang mensahe (4.33), sinisiguro tama ang ispelang ng mga salita bago ipost at ilagay sa comment section ang mensahe (4.29) at gumagamit ako ng Taglish (magkasamang Tagalog at Ingles) (3.58). Samantala, kung kinakailangan lang ginagawa ng mga mag-aaral ang mga indiketyor na hindi ako sigurado sa gramatika sa pagbuo ng mensahe (2.97), gumagamit ako ng AI sa pagbuo ng mensahe (2.93) at pinaiikli o kinakaltasan ko ng letra ang mga salita katulad ng “mhal m b ako” (2.60). Sa kabuuan, positibo ang mga mag-aaral sa kanilang gawi hinggil sa mga digital na diskurso batay sa pagsulat ng mensahe sa social media.

Pagbabasa ng mga Mensahe sa Social Media. Makikita pa rin sa talahanayan na paminsan-minsan lang ginagawa ng mga mag-aaral ang mga indiketyor na itinatama ko ang ispelang at gramatika ng mensahe sa isip ko lamang (3.83) at pinapansin ko ang mga maling ispelang ng mga salitang nababasa sa mga

posts at comments (3.59). Habang, kung kinakailangan lang na ginagawa ng mga mag-aaral na pinapansin ko ang maling gramatika ng mga mensahe sa mga posts at comments (3.47). Samantala, bihira laang na ginagawa ng mga mag-aaral ang mga indikatoryor na nagbibigay ako ng negatibong reaksyon gaya ng (sad at angry emoji) sa mga mensaheng may maling ispelang at gramatika (2.38), sinasabihan ko na mali ang ispelang at gramatika ng nagpost at nagcomment sa publiko (2.35) at sinasabihan ko na mali ang ispelang at gramatika ng nagpost at nagcomment sa pamamagitan ng private message (2.28). Sa kabuuan, positibo ang gawi ng mga mag-aaral hinggil sa mga digital na diskurso batay sa pagbabasa ng mga mensahe sa social media.

B. Antas ng Kasanayan ng mga Mag-aaral sa Gramatikang Filipino sa mga Impormal na Digital na Diskurso

Talahanayan 2. Antas ng Kasanayan ng mga Mag-aaral sa Gramatikang Filipino sa mga Impormal na Digital na Diskurso batay sa Pagkilala sa Mali, Kontekstwal na Gramatika at Gramatikong Pagpapaliwanag

	Pagkilala sa Mali		Kontekstwal na Gramatika		Gramatikong Pagpapaliwanag	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Napakababa ng Kasanayan	5	1.8	4	1.4	8	2.8
Mababa ang Kasanayan	53	18.7	43	15.1	59	20.8
Katamtaman ang Kasanayan	102	35.9	142	50.0	134	47.2
Mataas ang Kasanayan	124	43.7	95	33.5	83	29.2
Total	284	100.0	284	100.0	284	100.0

Makikita sa talahanayan 2 na nasa mataas hanggang katamtaman ang kasanayan ng mga tagatugon sa mga impormal na digital na diskurso batay sa pagkilala sa mali 124 (43.7%), kontekstwal na gramatika 142 (50%) at gramatikong pagpapaliwanag 134 (47.2). Ipinapakita ng datos na ang karamihan sa mga tagatugon ay may mataas hanggang katamtamang kasanayan sa impormal na digital na diskurso, partikular sa pagkilala ng mali, kontekstwal na gramatika, at gramatikong pagpapaliwanag.

C. Kaugnayan ng Gawi at Antas ng Kasanayan ng Gramatikang Filipino sa mga Impormal na Digital na Diskurso ng mga Mag-aaral

Talahanayan 3. Kaugnayan ng Gawi at Antas ng Kasanayan ng Gramatikang Filipino sa mga Impormal na Digital na Diskurso ng mga Mag-aaral

Pagbabasa ng mga Mensahe sa Social Media						
Pinapansin ko ang mga maling ispelang ng mga salitang nababasa sa mga posts at comments	.35*	.01	.29*	.01	.30*	.01
Pinapansin ko ang maling gramatika ng mga mensahe sa mga posts at comments	.41*	.01	.34*	.01	.40*	.01
Sinasabihan ko na mali ang ispelang at gramatika ng nagpost at nagcomment sa publiko	.34*	.01	.32*	.01	.31*	.01
Sinasabihan ko na mali ang ispelang at gramatika ng nagpost at nagcomment sa pamamagitan ng private message	.35*	.01	.33*	.01	.30*	.01
Itinatama ko ang ispelang at gramatika ng mensahe sa isip ko lamang	.21*	.01	.17*	.01	.15*	.01
Itinatama ko ang ispelang at gramatika ng mensahe at ilalagay sa comment section	.22*	.01	.30*	.01	.24*	.01
Hinahayaan ko na lamang ang mga maling ispelang at gramatika basta naiintindihan ko ang mensahe	.18*	.01	.15*	.01	.09 ^{ns}	.12
Nagbibigay ako ng negatibong reaksyon gaya ng (sad at angry emoji) sa mga mensaheng may maling ispelang at gramatika	.24*	.01	.29*	.01	.29*	.01

Legend: * = significant; ns = not significant at 0.05 level

Makikita sa talahanayan 3 na ang gawi ng mga mag-aaral sa pagsulat ng mensahe para sa social media ay may positibong ugnayan sa kanilang antas ng kasanayan sa Gramatikong Filipino sa mga Impormal na Digital na Diskurso. Mula sa mga datos, makikita na habang tumataas ang kanilang antas sa kasanayan sa Gramatikong Filipino sa mga Impormal na Digital na Diskurso ay higit nilang isinasagawa ang mga gawi na pinapansin ko ang mga maling ispelang ng mga salitang nababasa sa mga posts at comments (p-value=.01), pinapansin ko ang maling gramatika ng mga mensahe sa mga posts at comments (p-value=.01), sinasabihan ko na mali ang ispelang at gramatika ng nagpost at nagcomment sa publiko (p-

value=.01), sinasabihan ko na mali ang ispelang at gramatika ng nagpost at nagcomment sa pamamagitan ng private message (p-value=.01), itinatama ko ang ispelang at gramatika ng mensahe sa isip ko lamang (p-value=.01), Itinatama ko ang ispelang at gramatika ng mensahe at ilalagay sa comment section (p-value=.01) at nagbibigay ako ng negatibong reaksiyon gaya ng (sad at angry emoji) sa mga mensaheng may maling ispelang at gramatika (p-value=.01).

KONKLUSYON

1. Ipinakita ng resulta na may positibong gawi ang mga mag-aaral sa pagsulat ng mensahe sa social media, lalo na sa pagsisiguro ng tama ang gramatika at ispelang bago mag-post. Bagama't gumagamit sila ng Taglish at minsang umaasa sa AI, bihira nilang gamitin ang pinaikling mga salita o text speak. Ipinapakita nito na may kamalayan sila sa tamang paggamit ng wika kahit sa impormal na diskurso.
2. Ipinapakita ng datos na karamihan sa mga tagatugon ay may mataas hanggang katamtamang kasanayan sa impormal na digital na diskurso, lalo na sa pagkilala ng mali, paggamit ng kontekstwal na gramatika, at pagbibigay ng gramatikong paliwanag. Ipinapahiwatig nito na may sapat silang kakayahang sa wika kahit sa di-pormal na konteksto.
3. Ipinapakita ng resulta na may malinaw na positibong ugnayan ang gawi ng mga mag-aaral sa social media at ang kanilang kasanayan sa Gramatikong Filipino sa impormal na digital na diskurso. Habang tumataas ang antas ng kanilang kasanayan, mas nagiging mapanuri sila sa mga maling ispelang at gramatika sa mga post at komento. Lumalabas din na aktibo silang nakikibahagi sa pagtutuwid ng mga ito, sa publiko man, pribado, o sa kanilang isipan.

REKOMENDASYON

1. Gamitin sa pagtuturo ng Filipino ang mga aktwal na halimbawa ng mensahe sa social media upang mapalalim ang kaalaman sa wasto at epektibong komunikasyon. Dapat ding bigyang-gabay ang mga mag-aaral sa balanse at responsableng paggamit ng Taglish at AI upang mapanatili ang kasanayang gramatikal sa wikang Filipino.
2. Higit pang paunlarin ang kasanayan ng mga mag-aaral sa pamamagitan ng mga aktibidad sa klase na tumatalakay sa impormal na digital na diskurso. Maaaring gamitin ang aktwal na halimbawa mula sa social media upang hasain ang kanilang kaalaman sa gramatika at konteksto sa mas makabuluhang paraan.
3. Palawakin pa ang paggamit ng mga aktwal na halimbawa mula sa social media sa pagtuturo ng Filipino upang mapalalim ang kasanayan ng mga mag-aaral sa tamang gramatika at ispelang. Mahalaga ring hikayatin ang responsableng pakikialam sa mga maling gamit ng wika online upang mabuo ang disiplina at malasakit sa tamang paggamit ng wikang Filipino sa digital na espasyo.

PAGKILALA AT PASASALAMAT

Buong puso kong ipinapaabot ang aking pasasalamat sa lahat ng taong naging bahagi ng aking pananaliksik—mga indibidwal, institusyon, at higit sa lahat, sa Panginoong Diyos na naging tanglaw at lakas sa bawat hakbang ng aking paglalakbay.

Una, taos-puso akong nagpapasalamat sa Diyos para sa Kaniyang patuloy na paggabay, biyaya, at lakas na naging sandigan ko sa pagharap sa mga hamon ng pananaliksik na ito.

Lubos ang aking pasasalamat kay G. Dayson C. Lata, ang aking tagapayo, sa walang sawang pagbabahagi ng kanyang kaalaman at paggabay upang higit na mapabuti ang pananaliksik na ito.

Hindi ko rin matatawaran ang suporta ng aking pamilya—sa kanilang pagmamahal, pang-unawa, at patuloy na paninindigan sa aking tabi—na nagsilbing inspirasyon ko upang magpatuloy.

Maraming salamat din sa mga kalahok ng pag-aaral na buong puso kong pinasalamatan sa pagbabahagi ng kanilang oras at karanasan.

Gayundin, taos-puso kong pinasasalamatan ang aking mga kaibigan at kapwa mananaliksik na nagbigay ng teknikal na tulong at moral na suporta sa bawat yugto ng aking pagsisikap.

Sa lahat ng ito, ang Panginoon ang siyang naging dahilan ng tagumpay ng pananaliksik na ito. Sa Kaniya lahat ang papuri at pasasalamat.

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CREATIVITY AND INNOVATION EFFECTIVENESS IN RELATION TO TEACHING PERFORMANCE OF MULTIGRADE TEACHERS OF NUEVA VIZCAYA

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ABSTRACT

This study examined the creativity and innovation of multigrade teachers and their impact on teaching performance. Creativity and innovation were assessed in terms of openness to new ideas, curiosity, breaking old habits, developing and using ideas, willingness to try new things and take risks, bravery, hard work, and the creation and application of teaching materials. Teaching performance was measured using the Key Result Areas (KRAs) in the Individual Performance Commitment and Review Form (IPCRF), which include knowledge of teaching, student and learning environment management, lesson planning, assessment and reporting, and professional growth. To determine the relationship between creativity, innovation, and teaching performance, the study utilized a quantitative approach with a descriptive-correlational design. Data were gathered through survey questionnaires and the IPCRF from 30 teachers across 10 school districts in the Division of Nueva Vizcaya for the school year 2023–2024. The data were analyzed using the mean and the Pearson correlation coefficient. The findings revealed that the teachers demonstrated a very high level of creativity and innovation, and their teaching performance was likewise rated as very effective. A strong positive correlation was observed between their creativity and innovation and their overall teaching performance. These results suggest that the creative and innovative approaches of the teachers significantly contributed to their effective teaching practices. Based on these findings, an educational program was proposed to help sustain and further develop teachers' creativity, innovation, and teaching capabilities. This program aims to provide continuous support for enhancing their professional skills and improving overall teaching performance—ultimately benefiting the learning environment in multigrade classrooms.

Keywords: creativity and innovation effectiveness, teaching performance, multigrade teachers instructional competence, IPCRF, teacher development, 21st-century skills, educational innovation, learning outcomes, descriptive-correlational study

INTRODUCTION

Background of the Study

Education serves as the foundation of society, offering the best investment for nations to build prosperous, healthy, and equitable communities. According to Article 26 of the 1948 Universal Declaration of Human Rights, education is a fundamental right that opens opportunities for human development. However, despite its importance, over 57 million children remain out of school—hindered by factors such as poverty, lack of facilities, gender inequality, disabilities, and familial issues—which result in high dropout rates.

In 2015, the international community came together to address these educational challenges through the adoption of the 2030 Agenda for Sustainable Development. This agenda includes 17 Sustainable Development Goals (SDGs), which aim to transform the world by promoting actions that end poverty, inequality, and environmental degradation, while fostering peace and prosperity. Specifically, Goal 4 focuses on providing quality education for all, ensuring inclusivity and equity, and promoting lifelong learning opportunities. Despite significant progress, especially for girls, many children worldwide still face barriers

ers to education, and many fail to meet minimum proficiency standards in essential subjects such as reading and mathematics.

In the Philippines, although access to education has improved, significant challenges remain in delivering quality education, particularly to marginalized groups. Public education, though free, often remains out of reach for poorer families due to indirect costs. In response, the Philippine government has pursued initiatives such as the establishment of schools in underserved barangays and the implementation of multigrade classes to provide education in remote areas. Launched in 1993, the Multigrade Program aims to address teacher shortages, low enrollment rates, and insufficient resources—contributing to the country's commitment to achieving the Education for All goal and the SDGs for 2030.

The multigrade system, though effective in delivering education to communities with limited resources, continues to face challenges related to policy implementation and teacher preparedness. Multigrade teachers are expected to be versatile, employing various teaching strategies to ensure meaningful learning despite the diverse needs of their students. This requires flexibility, mastery of subject matter, and the ability to foster a collaborative, community-based learning environment.

In Nueva Vizcaya, as in other parts of the Philippines, the Multigrade Program has been embraced but still encounters challenges, including teacher shortages, geographical barriers, and low enrollment. These issues underscore the need for competent, creative, and innovative teachers who can adapt to the unique demands of multigrade classrooms. This study aims to investigate the relationship between creativity, innovation, and teaching performance among multigrade teachers in Nueva Vizcaya—contributing to the broader efforts of the United Nations Agenda 2030 for Sustainable Development and addressing the pressing needs in educational effectiveness and curriculum enhancement.

Statement of the Problems

The study assessed the creativity and innovation effectiveness level of multigrade teachers in the Division of Nueva Vizcaya for school year 2023-2024.

Specifically, the study sought to answer the following questions:

1. What is the level of creativity and innovation effectiveness of the multigrade teachers in terms of creative consciousness, level of curiosity, pattern breaking skills, idea nurturing ability, willingness to experiment and take risk, courage and resilience levels, energetic persistence and instructional materials development and utilization?
2. What is the respondents' level of teaching performance in terms of content knowledge and pedagogy, learning environment and diversity of learners, curriculum and planning, assessment and reporting, personal development and opportunity, and plus factor?
3. Is there a significant relationship between the creativity and innovation effectiveness of the respondents and their teaching performance?
4. Based on the significant findings of this study, what educational administration intervention can be developed?

Objectives of the Study

This study assessed the level of creativity and innovation effectiveness of multigrade teachers in the Division of Nueva Vizcaya for the school year 2023–2024.

Specifically, the objectives of the study are as follows:

1. To determine and describe the level of creativity and innovation effectiveness of multigrade teachers in terms of creative consciousness, level of curiosity, pattern-breaking skills, idea-nurturing ability, willingness to experiment and take risks, courage and resilience, energetic persistence, and instructional development and utilization.
2. To assess teaching performance in pedagogy, learning environment, and planning, in terms of content knowledge and understanding of learner diversity, curriculum, assessment and reporting, personal development and opportunities, and plus factors.
3. To establish the relationship between the creativity and innovation effectiveness of the respondents and their teaching performance.
4. To develop an educational administration intervention based on the significant findings of the study.

Null Hypothesis

The hypothesis pursued in this study is that there is no significant relationship between the respondents' level of creativity and innovation effectiveness and their teaching performance.

RESEARCH METHODOLOGY

Research Design

This study utilized a quantitative research design. Quantitative research is regarded as the systematic investigation of phenomena through the collection of numerical data and the application of statistical, mathematical, or computational techniques. Its foundation lies in the positivist paradigm, which promotes methods embedded in statistical analyses, including inferential statistics, hypothesis testing, mathematical modeling, experimental and quasi-experimental designs, randomization, structured protocols, and the use of questionnaires with a limited range of predetermined responses (Slevitch, 2011, as cited by Adedoyin, 2020).

Research Method

The study employed a descriptive-correlational method, utilizing a questionnaire to gather data on the creativity and innovation effectiveness of teachers, and documentary analysis to assess their teaching performance. The descriptive-correlational method is used in studies that aim to present a snapshot of specific situations while also establishing relationships between variables (McBurney & White, 2009). The descriptive method was specifically applied to describe the respondents' levels of creativity, innovation effectiveness, and teaching performance. Meanwhile, the correlational method was used to determine the relationship between teachers' creativity and innovation effectiveness and their teaching performance.

Research Environment

This study was conducted in the Schools Division of Nueva Vizcaya during the school year 2023–2024. The province of Nueva Vizcaya is predominantly mountainous and is located in the southern part of the Cagayan Valley. It serves as the gateway to Region II. Established in 1819, the province originally covered a total land area of 390,398 hectares. However, substantial portions of its territory were later ceded—first to the province of Isabela in 1836, then to the newly established province of Ifugao in 1908, and subsequently to the creation of Quirino province through Republic Act 6394. These changes reduced Nueva Vizcaya's land area, population, and revenue base. Today, the province comprises 15 municipalities, namely: Alfonso Castañeda, Santa Fe, Aritao, Dupax del Sur, Dupax del Norte, Bambang, Bayombong, Solano, Quezon, Bagabag, Villaverde, Diadi, Kasibu, Kayapa, and Ambaguio. Nueva Vizcaya is recognized as a multi-awarded province in the country. As a school division, DepEd Nueva Vizcaya envisions Filipinos who passionately love their country and whose values and competencies enable them to realize their full potential and contribute meaningfully to building the nation. As a learner-centered public institution, the Department of Education continuously improves itself to better serve its stakeholders.

Its mission is to protect and promote the right of every Filipino to quality, equitable, culture-based, and complete basic education where students learn in a child-friendly, gender-sensitive, safe, and motivating environment; teachers facilitate learning and constantly nurture every learner; administrators and staff, as stewards of the institution, ensure an enabling and supportive environment for effective learning to happen; and family, community, and other stakeholders are actively engaged and share responsibility for developing lifelong learners as cited by Biazon, 2015).

Sampling Method	Selection Criteria	Identified School Districts	Respondents
Simple Random Sampling	School districts with multigrade classes were selected	Aritao II, Bambang I, Bagabag II, Kasibu East, Kasibu West, Kayapa East, Kayapa West, Quezon, Santa Fe, Villaverde	Selected school districts with multigrade classes
Purposive Sampling	Three multigrade teachers per school were chosen	Schools from the identified districts	Three multigrade teachers per school

A total of 30 respondents were selected, which is considered an acceptable sample size for a descriptive-correlational study. According to Gay, as cited by Kindot (2014), thirty is the minimum sample size required for such studies. Similarly, Sevilla (1998), as cited by Bianzon (2015), stated that correlational studies do not necessarily require a large number of respondents. She explained that if a relationship exists, it can still be observed in a small sample, provided that the sample is representative of the population and the data-gathering tool is valid and reliable. The division has approximately three to four multi-grade schools, with about nine to twelve multigrade teachers in each school, totaling around 138 to 180 multigrade teachers.

To ensure the accuracy of the data collected, total enumeration of the target population was employed. Canonizado (2021) explained that total population sampling is a method wherein all members of a specific group are included in the study. This method is typically used when the group is small and well-defined, as even a portion of it can yield valuable insights. Although this method minimizes selection bias, it also requires more time and resources to implement.

Table 2. Frequency and Percentage Distribution of Respondents per District

School/District	Frequency	Percentage
Aritao II	3	100
Bambang II	3	100
Bagabag II	3	100
Kasibu East	3	100
Kasibu West	3	100
Kayapa East	3	100
Kayapa West	3	100
Quezon	3	100
Santa Fe	3	100
Villaverde	3	100
Total	30	100

Research Instrument

This study utilized a two-part questionnaire to collect pertinent data to answer the problems posted in Chapter 1.

Part I measure the creativity and innovation effectiveness of the respondents in terms of creative consciousness, levels of curiosity, pattern breaking skills, idea nurturing ability, willingness to experiment and take risks, energetic persistence, and instructional materials development and utilization. This research questionnaire was patterned after the creativity and innovative assessment of McKay and Kaufman, with some modifications to suit the study and respondents.

The respondents were asked to answer the items in the questionnaire following the scale below.

Scale	Qualitative Description
4	All the time
3	Most of the time
2	Rarely
1	Never

For the interpretative description of their response, the range and interpretation of their responses, the range and interpretation are as follows:

Range	Interpretative Description
3.50 – 4.0	Very High
2.50 – 3.49	High
1.50 - 2.49	Low
1.00 – 1.49	Very Low

Part II. This instrument measures the Individual Performance Commitment for Regular Teachers based on DepEd Form (IPCRF). It measures the individual performance of teachers in ket result areas (KRA) along: content knowledge and pedagogy, learning environment and diversity of learners, curriculum and planning, assessment and reporting and professional growth and development. The KRA are rated based on quality, efficiency, and timeliness. Each KRA is rated based on the level to which the objectives of the KRA are attained considering quality, efficiency and timeliness as prescribed in the

DepEd IPCRF. Data were accessed from the district office of the school district where the respondents belong.

The range used to determine teachers' performance level are as follows:

Range	Qualitative Description
4.50 – 5.00	Outstanding
3.50 – 4.49	Very Satisfactory
2.50 - 3.49	Satisfactory
1.50 – 2.49	Unsatisfactory
1.49 - below	Poor

Data Gathering Procedure

The researcher first sought permission to conduct the study from the Office of the Schools Division Superintendent through proper channels. Upon approval, a similar letter was sent to the different school principals or school heads through their respective District Supervisors (PSDS).

The purpose of the study was explained to the participants to ensure full cooperation and a smooth data collection process. It was also emphasized that their participation was voluntary; hence, a consent form was signed between the researcher and the participants. The researcher clearly explained that any private information voluntarily disclosed would be handled with the utmost confidentiality, in accordance with the Data Privacy Act, and used solely for the purpose of this study.

The researcher personally distributed the questionnaires to the participants, strictly observing the minimum public health standards. The gathered data were tabulated, treated, analyzed, and interpreted using the appropriate statistical tools. The used questionnaires were properly disposed of to protect the confidentiality of the participants' data.

Statistical Treatment Data

The collected data were treated using the following statistical tools:

Mean and Standard Deviation: These were used to determine the respondents' level of creativity and innovation effectiveness, as well as their teaching performance.

Pearson r: This was run to determine if a significant relationship exists between the level of creativity, innovation effectiveness, and teaching performance. The significance level for the relationship was set at 0.05.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This study focused on determining the creativity and innovation effectiveness level of multigrade teachers and their teaching performance. Creativity and innovation encompass several components: creative consciousness, level of curiosity, pattern-breaking skills, idea-nurturing ability, willingness to experiment and take risks, courage and resilience, energetic persistence, and instructional materials development and utilization. On the other hand, teaching performance was assessed using the Key Result Areas (KRAs) in the Individual Performance Commitment and Review Form (IPCRF), namely: content knowledge and pedagogy; learning environment and diversity of learners; curriculum and planning; assessment and reporting; and professional growth and development. The study aimed to ascertain the relationship between creativity and innovation effectiveness and teaching performance. Based on the significant findings, an educational intervention was proposed.

A quantitative research design was used, specifically the descriptive-correlational method. Survey questionnaires and the IPCRF were utilized to gather relevant data from 30 respondents drawn from 10 school districts in the Division of Nueva Vizcaya for the school year 2022–2023. Data were statistically treated and analyzed using the mean and Pearson-r correlation, and results were correspondingly interpreted.

Significant findings

The following are the significant findings of the study:

Dimension	Mean	Standard Deviation
Creativity and Innovation Effectiveness	3.918	0.568
Creative Consciousness	3.87	0.593
Levels of Curiosity	3.92	0.6
Pattern Breaking Skills	3.83	0.565
Idea Nurturing Activity	3.91	0.73
Willingness to Experiment and Take Risks	3.9	0.72
Courage and Resilience	3.8	0.743
Energetic Persistence	4.0	0.665
Instructional Material Development and Utilization	4.11	0.63
Teaching Performance	4.61	0.35
Content Knowledge and Pedagogy	0.947	0.148
Learning Environment and Diversity of Learners	0.911	0.124
Curriculum and Planning	0.956	0.0895
Assessment and Reporting	0.898	0.124
Professional Growth and Development	0.899	0.0883

Discussion of Findings

Creativity and Innovation Effectiveness

The multigrade teachers demonstrated a very high level of creativity and innovation effectiveness, with an overall mean score of 3.918 and a standard deviation of 0.568. The highest mean was recorded in Instructional Material Development and Utilization (mean = 4.11), highlighting the teachers' excellence in creating and utilizing instructional materials. Other components, such as Willingness to Experiment and Take Risks (mean = 3.90) and Energetic Persistence (mean = 4.00), also showed strong results. These findings indicate that the teachers are not only persistent but also open to exploring new methods in their teaching practices. Overall, this suggests that multigrade teachers are highly innovative and resourceful.

Teaching Performance

The overall teaching performance of the multigrade teachers was rated as outstanding, with a mean score of 4.61 and a standard deviation of 0.350. This score reflects the teachers' strong command of content knowledge and pedagogy. The highest mean scores were found in Curriculum and Planning (mean = 0.956) and Content Knowledge and Pedagogy (mean = 0.947), signifying their ability to design and deliver effective lessons. The low standard deviations in these areas suggest consistency in performance across various aspects of teaching.

Relationship Between Creativity and Teaching Performance

A significant relationship was identified between the teachers' level of creativity and innovation effectiveness and their teaching performance. The computed correlation coefficient ($r = 0.356$) and the p-value of 0.049 indicate a moderate positive relationship between the two variables. This means that as teachers become more effective in creativity and innovation, their teaching performance also improves. In summary, the findings affirm that creativity and innovation are critical contributors to enhancing teaching performance among multigrade teachers. The positive correlation underscores the importance of fostering continuous development in these areas to sustain and improve educational outcomes.

CONCLUSIONS

Based on the main findings of the study, the following conclusions were made:

1. The teachers showed a very high level of creativity and innovation in all areas.
2. The teachers performed very well in their teaching duties and achieved their goals in each Key Result Area (KRA) of the IPCRF.
3. There is a clear connection between the teachers' creativity and innovation and how well they perform in teaching.
4. An educational program or activity is needed to help maintain and further improve the teachers' creativity, innovation, and teaching performance.

RECOMMENDATIONS

In light of the conclusions, the following recommendations are given:

1. School management is encouraged to promote a culture of creativity and innovation by supporting multigrade teachers in trying and applying new teaching methods. This includes giving them professional development activities focused on creativity and innovation and setting up ways for them to share ideas with fellow teachers to build teamwork and improve the teaching environment.
2. Teaching performance can be maintained and strengthened by recognizing and appreciating the excellent work of multigrade teachers. This helps boost their morale and motivation. Support and resources may also be provided to help them continue growing. Regular evaluations help identify both their strengths and areas that need improvement.
3. Creativity and innovation can be included in teacher training through programs that help multigrade teachers and future educators gain skills and attitudes needed for effective teaching in changing learning environments. These programs highlight creativity and innovation as important parts of teaching success and promote teamwork with education groups when creating new learning ideas.
4. Research and collaboration may be supported by encouraging teachers to do research—individually or in groups—on creativity, innovation, and teaching performance. Teachers, researchers, and decision-makers can work together by sharing ideas, experiences, and practices to support professional growth.
5. Opportunities for reflection and feedback can be created by setting up ways for multigrade teachers to reflect on their teaching, try out new strategies, and receive helpful feedback. This supports a growth mindset and encourages teachers to value learning, improve their skills, and pursue topics they are passionate about.
6. The proposed educational intervention may be carried out at the division or district level to gain deeper understanding of creativity, innovation, and teaching performance.
7. Regular LAC (Learning Action Cell) sessions are highly recommended to give teachers a space for sharing ideas, learning together, and continuously improving their teaching practices.

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VOCABULARY SIZE AND READING COMPREHENSION SKILLS OF GRADE IV PUPILS: BASES FOR LEARNING INTERVENTION

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ABSTRACT

This research study was conducted to determine the relationship of vocabulary size with the level of reading comprehension skills of 91 Grade IV pupils at Kasibu Central School, Kasibu, Nueva Vizcaya. Specifically, it determined the learners' vocabulary size through a researcher-made Vocabulary Size Test and their level of reading comprehension skills through PHIL-IRI pre-test material following the computation formulated by PHIL-IRI. Results showed that 85.7% of the respondents have very low vocabulary size, and 63.7% are at the frustration level of reading comprehension. Vocabulary size and reading comprehension have a significant positive correlation as evidenced by a Spearman's Rho of 0.519 and a p-value of 0.001. Based on the study's findings, it is concluded that as the vocabulary size of the respondents increases, their reading comprehension skills improve correspondingly. The positive nature of this correlation highlights the critical role that vocabulary development plays in enhancing reading comprehension. Learners with larger vocabulary are better equipped to decode words, understand complex texts, and make inferences, which are all essential components of reading comprehension. This relationship suggests that efforts to improve students' vocabulary can have a direct and significant impact on their reading comprehension abilities. This study has developed a learning intervention entitled Empowering Rigorous Interventions for Knowledge Acquisition (ERIKA), designed for Grade 4 pupils to improve their vocabulary.

Keywords: Vocabulary size, reading comprehension, PHIL-IRI, vocabulary size test

INTRODUCTION

When reading a sentence, it is difficult to comprehend the message if many of the words are unfamiliar to the reader. But if the words are familiar, the reader knows the meaning of those words, he/she can comprehend the meaning of the whole sentence and beyond the literal level. This is why having a large vocabulary is a great help in understanding the meaning of a whole text.

The ability to comprehend what is read is an essential skill that supports academic achievement and lifelong learning. Reading comprehension is often regarded as a key indicator of students' overall academic ability, influencing their success across various subjects. At the heart of reading comprehension lies vocabulary knowledge, which enables pupils to interpret and grasp the meanings of words they encounter. Without a sufficient vocabulary, pupils may struggle to understand written texts, limiting their ability to fully engage with and interpret the material (Daenos & Santillan, 2020).

Reading comprehension is a cornerstone of academic success, and vocabulary knowledge is vital. Research indicates a strong link between vocabulary size and reading proficiency, particularly among elementary pupils. Filipino learners often face challenges in vocabulary development, exacerbated by disruptions from the COVID-19 pandemic (Tomas, 2021; Tria, 2020). This study explores the correlation between vocabulary size and reading comprehension among Grade IV pupils at Kasibu Central School, aiming to inform intervention strategies.

Vocabulary size and reading comprehension are deeply interconnected. A strong vocabulary foundation enables a person to decode unfamiliar words using context clues and prior knowledge, which enhances his/her overall comprehension. Some studies have shown a positive relationship between vocabu-

lary size and reading comprehension skills. A person with high vocabulary demonstrates higher reading comprehension levels, as he/she is better equipped to understand texts (McKeown, 2019; Clemens, Simmons, Simmons, Wang, & Kwok, 2017). Moreover, a person with limited vocabulary knowledge often struggles with decoding and comprehension, which can hinder their academic progress.

Given these challenges and their potential impact on pupils' educational progress, there is a critical need for targeted reading interventions to enhance vocabulary size and reading comprehension skills among Grade IV pupils. Identifying effective strategies will allow educators to develop evidence-based approaches that support students in building a strong vocabulary foundation, ultimately improving their reading proficiency.

This study explores the relationship between vocabulary size and reading comprehension levels among Grade IV pupils at Kasibu Central School as a basis for reading intervention. By assessing their vocabulary size and reading comprehension skills, the research seeks to identify areas requiring intervention and provide insights into effective instructional strategies. The findings will improve vocabulary acquisition and reading comprehension, offering practical recommendations for educators, policymakers, and curriculum developers to enhance literacy education. Aligned with the Department of Education's thrust to improve literacy among early grade learners, this study addresses the critical role of vocabulary development in enhancing reading comprehension.

Rooted in the Simple View of Reading theory (Gough & Tunmer, 1986) and Vygotsky's Sociocultural Theory, the study investigates vocabulary acquisition as a socially mediated process essential to reading comprehension. It seeks to address critical literacy issues aligned with SDG 4: Quality Education.

In addition, this research aligns with the OECD's PISA framework, which identifies reading comprehension—including the ability to understand and use vocabulary in context—as a critical skill for success in the 21st century. The latest results from the 2022 Programme for International Student Assessment (PISA) indicate that Filipino students continue to perform below the global average in reading, mathematics, and science. The assessment, conducted by the Organization for Economic Co-operation and Development (OECD), involved over 690,000 15-year-old students from 81 countries. The Philippines' Performance in reading under PISA 2022 was an average score of 347 points, up from 340 in 2018. However, this remains well below the global average of 476 points. These results suggest that Filipino students are approximately 5 to 6 years behind their peers from other countries in learning competencies. According to the OECD, each 20-point deficit from the average represents about one year of learning. Proficiency Levels: 24% of the students attained Level 2 or higher, with almost no students reaching the top proficiency levels. Despite minor improvements, the Philippines' performance in PISA 2022 still indicates challenges in the education system. Thus, the Department of Education (DepEd) has acknowledged the need for comprehensive reforms to address these issues and improve student outcomes.

A key aspect of this study is using the Reading Comprehension Test patterned to the Philippine Informal Reading Inventory (Phil-IRI) as an assessment tool. Phil-IRI provides a standardized framework for evaluating reading proficiency, ensuring consistency, validity, and reliability in assessing vocabulary size and comprehension skills. As a widely recognized tool within the Philippine education system, Phil-IRI offers diagnostic insights that can help pinpoint specific reading challenges faced by Grade IV pupils. Through this established benchmark, the study aims to provide actionable recommendations for improving reading instruction, thereby contributing to the broader goal of fostering literacy development and academic success.

The integration of Phil-IRI and an in-depth analysis of the relationship between vocabulary size and reading comprehension, this research will generate valuable insights for educators and policymakers. The findings will support the development of evidence-based interventions designed to enhance Grade IV pupils' reading proficiency at Kasibu Central School, ensuring they acquire the necessary skills to excel academically and beyond.

Statement of the Problem

This study primarily aims to develop a reading intervention based on the identified correlation between vocabulary size and the level of reading comprehension skills among Grade IV pupils at Kasibu Central School. Specifically, it seeks to address the following questions:

1. What is the vocabulary size of the Grade IV pupils at Kasibu Central School?

2. What is the level of reading comprehension skills of the respondents?
3. Is there a significant correlation between the two variables?
4. What reading intervention may be developed based on the results of the study?

Objectives of the Study

The primary objective of this study is to create a reading intervention by examining the correlation between vocabulary size and level of reading comprehension skills among Grade IV pupils at Kasibu Central School. Specifically, the study sought to:

1. measure the vocabulary size of Grade IV pupils of Kasibu Central School;
2. evaluate the level of reading comprehension skills of the respondents;
3. investigate the relationship between vocabulary size and level of reading comprehension skills; and
4. provide recommendations for reading intervention strategies.

METHODOLOGY

This chapter outlines the research design, research environment, respondents of the study, sampling procedure, research instruments, and statistical treatment of data. It provides a comprehensive overview of how the study was conducted to explore the relationship between vocabulary size and reading comprehension among Grade IV pupils.

Research Design

This study employed a quantitative research design, which is widely recognized for its emphasis on numerical data, statistical analysis, and objective measurement. Quantitative research provides a systematic and replicable framework for exploring relationships between variables through empirical data. This design was chosen because it can yield precise, generalizable, and statistically valid results. In the context of this study, the quantitative approach was deemed appropriate for investigating the relationship between vocabulary size and reading comprehension skills among Grade IV pupils, without manipulating any variables.

The strength of the quantitative design lies in its capacity to analyze trends and patterns across a larger sample, ensuring that the findings are reliable and applicable to broader educational settings. Moreover, it allows the researcher to conclude with a high degree of confidence through hypothesis testing and standardized instruments. This approach provides clarity and objectivity by focusing on measurable indicators.

Using the descriptive method enabled the researcher to summarize and present the pupils' vocabulary and reading comprehension performance using frequency counts, means, and percentage scores. The correlational aspect was used to examine the statistical association between the two variables, specifically using Spearman's rank-order correlation coefficient (ρ) to determine the direction and strength of the relationship between vocabulary size and reading comprehension level, given the ordinal nature of some of the data.

This method is particularly suitable for educational research in which understanding naturally occurring relationships is critical for informing instructional practices. This study enabled the researcher to identify whether a significant relationship exists between vocabulary size and reading comprehension, and to what extent one variable may influence the other.

Research Environment and Respondents

The study was conducted at Kasibu Central School, Nueva Vizcaya, Philippines, involving all 91 Grade IV pupils during the 2023–2024 academic year. The Grade 4 level was chosen as the focus of this study, and all Grade 4 pupils across three different sections of the school were selected as the research respondents. This approach ensured that the sample represented the entire cohort of Grade 4 pupils, providing a comprehensive overview of the vocabulary size and reading comprehension levels within this grade.

The selection was based on their enrollment in the school and their active participation in regular academic activities. The pupils from these three sections were exposed to a standard curriculum pre-

scribed by the Department of Education (DepEd), which includes subjects and lessons to develop reading and comprehension skills with vocabulary acquisition.

Grade 4 pupils were chosen as the respondents because this is the Stage of Critical Transition, a pivotal shift in learners' academic journey, an ideal stage to assess reading comprehension skills and vocabulary knowledge. This is when children move from learning to read to reading to learn.

As such, the Department of Education (DepEd) curriculum places greater importance on independent reading, content-area texts, and vocabulary expansion in Grade 4. Pupils are thus expected to read and understand more complex texts, making it a suitable level to explore the role in comprehension.

Also, by Grade 4, pupils have already received several years of formal instruction in reading. At the age of 9-10, they have developed sufficient cognitive and language skills to engage with vocabulary assessments and reading comprehension tasks meaningfully and independently. They are usually capable of following instructions, working independently for short periods, and reflecting on their reading, making them practically accessible for research involving assessments or interventions.

Assessing them at this level provides insight into the effectiveness of early literacy programs and identifies potential gaps before entering the next grade level. This mechanism provides a valuable baseline for interpreting how vocabulary size influences performance in standardized reading tests.

Sampling Procedure

This study used total enumeration sampling, where all Grade 4 pupils at the school participated as respondents. This method was chosen to ensure that the entire grade level was well-represented, allowing for a comprehensive data collection regarding vocabulary size and reading comprehension across the age group.

All 91 Grade 4 students were included to eliminate any sampling bias, which would guarantee that the findings apply to the full grade level. The study included pupils regardless of their academic performance or background, as the primary objective was to examine the relationship between vocabulary size and reading comprehension, necessitating the inclusion of a wide range of vocabulary knowledge and comprehension abilities within this grade.

Pupils who were absent during data collection or had learning disabilities that hindered their participation were excluded from the study. However, no pupil was deliberately excluded based on academic standing or personal characteristics, ensuring the sample accurately reflected the diversity of Grade 4 learners.

Research Instruments

The study utilized two primary instruments for data collection.

Vocabulary Size Test. This 40-item vocabulary size test was developed drawing from the standard number of items typically used in assessments for Grade 4 pupils by the Department of Education (DepEd). The words included in the test were selected from the Basic Sight Words for Grade 4 pupils, reflecting the vocabulary levels appropriate for this grade. The test was validated by language experts with doctorate degrees, ensuring its validity. It evaluates the respondents' understanding and application of words and phrases commonly encountered in reading materials.

This test was piloted on Grade 5 pupils of Paquet Integrated School in coordination with the school head and adviser. The researcher supervised the test, and 20 pupils took the test. The researcher checked the test and organized the data before sending it to the statistician. The reliability coefficient of the Vocabulary Size Test was 0.791, which means the test is reliable.

The vocabulary size in this study was estimated using a standardized vocabulary test adapted from the work of Nation and Anthony (2016), who developed tools specifically designed to estimate the number of word families a learner knows. The test consists of multiple-choice or word-recognition items that assess a student's knowledge of high-frequency and mid-frequency words.

Each correct response in the test corresponds to an estimated number of words known, based on a statistical correlation between test scores and vocabulary size.

This framework provides a structured approach for gauging the vocabulary size, with a clear correlation between score intervals and corresponding vocabulary size ranges. For instance, a score of 31-40 signifies a vocabulary size ranging from 3,100 to 4,000 words, indicating a "high vocabulary size," while a score of 1-10 corresponds to a "very low vocabulary size," which ranges from 100 to 1,000 words.

These ranges are based on scaling methods used in Nation and Anthony's Vocabulary Size Test (VST), which correlates the total correct answers to the estimated number of word families known. The test assumes a linear relationship between scores and vocabulary knowledge, allowing researchers to predict vocabulary breadth without directly testing every known word.

The reading comprehension skills test was patterned after the PHIL-IRI test employed for reading comprehension. For further analysis and interpretation of the respondents' scores in their Reading Comprehension Skills Test, the Phil-IRI Oral Reading Profile is used.

Data Gathering Procedure

The researcher wrote a 40-item Vocabulary Size Test and had it validated by language experts. This test was piloted on Grade 5 pupils of Paquet Integrated School in coordination with the school head and adviser. The researcher supervised the test, and 20 pupils took the test. The researcher checked the test and organized the data before sending it to the statistician. The reliability coefficient of the Vocabulary Size Test was 0.791 using Cronbach's Alpha, which means the test is reliable.

On the other hand, the reading comprehension test was patterned after the PHIL-IRI test. This test was also piloted on Grade 5 pupils of Paquet Integrated School in coordination with the school head and adviser. The researcher also supervised the test; the same 20 pupils took the test. The researcher checked the test and organized the data before sending it to the statistician. The reliability coefficient of the Reading Comprehension Test was 0.955 using Cronbach's Alpha, which indicates that the patterned test in PHIL-IRI is highly reliable and measures a consistent construct.

Before administering the two tests, the researcher sought approval by submitting a letter to the district-in-charge of Kasibu West District and the principal of Kasibu Central School, where the tests would be administered. Once permission was granted, the researcher coordinated with the Grade 4 class advisers and arranged a schedule for administering the two tests consecutively. The PHIL-IRI test was administered first to the three Grade 4 sections, with all pupils completing the test simultaneously within 15 minutes. Following this, the Vocabulary Size Test was given to the same group. The participants completed both tests individually within the designated time limits. The tests were administered under supervision to ensure adherence to the procedure and to prevent cheating. Afterward, the researcher collected all the test and checked it. The researcher organized the data and consulted a statistician for the analysis and interpretation of the results.

Ethical considerations were strictly adhered to throughout the study. Confidentiality was ensured by anonymizing the respondents' data. Participation was voluntary, and informed consent was obtained from the respondents and their parents. The respondents were given the right to withdraw from the study at any point without conditions.

Statistical Treatment

The following descriptive statistics were applied to provide a thorough overview of the data:

Mean. The mean was calculated to determine the average vocabulary size and reading comprehension scores. This measure offers a central value representing the performance of the students in relation to their vocabulary and reading comprehension abilities.

Standard Deviation. This was calculated to evaluate the variability or spread of the vocabulary size and reading comprehension scores among the students. This measure provides insights into how much individual scores differ from the mean. A higher standard deviation suggests greater variation, indicating significant differences in vocabulary size and reading comprehension levels across the students.

Spearman rho. This statistical technique, also known as Spearman's rank correlation coefficient, measures the strength and direction of the relationship between two variables. It is specifically designed to work well with ranks and ordinal data. It was to determine the correlation between vocabulary size and reading comprehension skills. A significance level of 0.05 was set for testing the statistical significance of the correlation.

FINDINGS

This section presents the findings on the relationship between vocabulary size and reading comprehension skills among Grade IV pupils at Kasibu Central School. The results are organized into three main areas: (1) the distribution of pupils' vocabulary size, (2) the level of reading comprehension skills, and (3) the correlation between vocabulary size and reading comprehension.

The data highlight critical trends regarding pupils' literacy abilities, revealing significant challenges in vocabulary development and reading comprehension. The analysis further establishes a significant positive correlation between the two variables, emphasizing the important role of vocabulary in enhancing reading comprehension. These findings serve as a basis for designing targeted interventions to improve literacy outcomes among the pupils.

Vocabulary Size of Grade IV Pupils

Vocabulary Size	Frequency	Percent
High vocabulary size	0	0
Average vocabulary size	11	12.1
Low vocabulary size	78	85.7
Very low vocabulary size	2	2.2
Total	91	100.0
Mean:	16.26	(Low vocabulary size)

The data shows that most Grade 4 pupils at Kasibu Central School have a low vocabulary size, with 85.7% categorized as low and 2.2% as very low. Only 12.1% achieved an average vocabulary size, and none reached the high category. The mean score of 16.26 further indicates a low vocabulary proficiency among the pupils.

These findings highlight a serious concern, suggesting that most pupils lack the vocabulary for successful comprehension and academic achievement. Contributing factors may include limited access to reading materials, insufficient vocabulary instruction, and socio-economic barriers (Lesaux, Jones, & Galloway, 2023; OECD, 2023).

The absence of pupils in the high category emphasizes the urgent need for vocabulary-focused interventions and teachers' professional development. Strengthening vocabulary instruction through targeted activities and fostering student motivation are essential to closing this gap and improving literacy outcomes (Neuman & Wright, 2023; Quinn, Wagner, & Petscher, 2021).

Level of Reading Comprehension Skills

Level of Reading Comprehension Skills	Frequency	Percent
Independent	10	11.0
Instructional	23	25.3
Frustration	58	63.7
Total	91	100.0
Mean:	9.85	(Frustration)

The table shows that a majority (63.7%) of Grade IV pupils at Kasibu Central School are at the frustration level in reading comprehension, with only 25.3% at the instructional level and 11.0% achieving independent reading skills. The mean score of 9.85 reflects overall frustration-level performance.

The low number of independent readers indicates gaps in foundational literacy development and highlights the need for stronger and earlier interventions. Pupils at the instructional level benefit from guided support but require continuous scaffolding to transition toward independent reading. Meanwhile, the high proportion of pupils at the frustration level signals urgent challenges in decoding, understanding, and engagement, likely caused by gaps in instruction, socio-economic factors, and motivational issues.

Addressing these issues requires early identification of learning difficulties, differentiated instruction, and a comprehensive, multi-tiered support system that targets academic and emotional needs. Furthermore, awareness of Specific Reading Comprehension Deficit (S-RCD) is crucial, as some pupils may decode fluently but still struggle to understand texts, requiring specialized interventions (Logsdon, 2021).

Overall, the data emphasizes the urgent need for targeted literacy programs and holistic support strategies to boost reading comprehension outcomes among the pupils.

Correlation Between Vocabulary Size and Reading Comprehension

Correlation between vocabulary size and level of reading comprehension skills

Variables	N	Spearman rho	p-value	Remark
Vocabulary Size and Reading Comprehension Skills	91	0.519	0.001	Significant

The table above reveals a significant positive correlation (Spearman's $\rho = 0.519$, $p = 0.001$) between vocabulary size and reading comprehension skills among Grade IV pupils at Kasibu Central School. This result indicates that as pupils' vocabulary size increases, their reading comprehension likewise improves, affirming the crucial role of vocabulary development in literacy growth.

The findings highlight the importance of integrating explicit vocabulary instruction into reading programs, beginning early in education. Regular vocabulary assessments can help identify struggling pupils and inform targeted interventions to strengthen vocabulary knowledge and comprehension skills.

These results are consistent with related studies (Ridha et al., 2019; Chavangklang et al., 2019; Quinn et al., 2020), which affirm that vocabulary size significantly predicts reading comprehension ability. Thus, prioritizing vocabulary instruction can lead to broader academic success by equipping students with the language skills necessary for deeper text understanding and critical thinking.

The findings confirm that limited vocabulary is a significant barrier to reading comprehension. The high proportion of pupils in the low vocabulary and frustration reading categories aligns with previous studies (Snow, 2022; Lesaux et al., 2023) emphasizing vocabulary as a foundational skill.

The significant correlation between vocabulary size and comprehension supports theories posited by Quinn et al. (2020) and Ocampo & McNeill (2019), suggesting vocabulary development is essential for improving reading proficiency.

As shown, vocabulary acquisition directly affects comprehension; thus, vocabulary enrichment interventions can substantially improve pupils' reading abilities. Research supports game-based, explicit vocabulary instruction as an effective strategy (Bauer & Tang, 2022; Wright & Cervetti, 2021).

CONCLUSIONS

Based on the significant findings of this study, several key conclusions are drawn regarding the vocabulary size and reading comprehension skills of Grade 4 pupils at Kasibu Central School.

1. The majority of Grade 4 pupils at Kasibu Central School have low to very low vocabulary sizes.
2. A significant portion of the students are struggling with reading comprehension.
3. A significant positive correlation between vocabulary size and reading comprehension skills indicates that students with larger vocabularies tend to have better reading comprehension skills.

RECOMMENDATIONS

Based on the significant findings and conclusions derived from this study, the following recommendations are offered:

1. To address the low vocabulary size among Grade 4 pupils at Kasibu Central School, explicit vocabulary instruction may be implemented, focusing on word meanings, contextual usage, and word-learning strategies.
2. To improve the reading comprehension of the respondents, teachers may consider a multi-faceted intervention program such as self-monitoring and think-aloud techniques using multisensory approaches.
3. Further research may be conducted to study the effectiveness of this output, address gaps identified in this study, particularly in studying the effectiveness of specific vocabulary instruction strategies in improving reading comprehension.

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ENHANCING WORD PROBLEM SOLVING MASTERY LEVEL OF GRADE 11 STUDENTS AT ARITAO NATIONAL HIGH SCHOOL THROUGH PROJECT MENTORING, ENGAGING AND ENSURING TIMELY HELPING HANDS TO THE LEARNERS (MEET)

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ABSTRACT

Problem-solving remains a critical skill in today's modern society, yet mathematical word problems continue to challenge many students. This study explores the effectiveness of Project Mentoring, Engaging, and Ensuring Timely helping hands to the learners (MEET) in providing the mastery level of Grade 11 TVL and HE learners in General Mathematics for the school year 2024-2025. Specifically, it aimed to measure learners' mastery levels before and after the intervention across three key learning competencies and to identify the challenger encountered during implementation. A sequential explanatory mixed-method design using pretest and posttest assessments was employed. The intervention involved structured mentoring and engagement strategies tailored to support learners' needs. Data were collected through test score and student feedback. Results showed a positive shift in learners' problem-solving abilities, suggesting that focused mentoring and timely support significantly contribute to better academic outcomes. Notably, the mean scores moved toward a higher mastery level, although the second competency, solving problems involving rational functions, rational equations and rational inequalities, remained within the developing level. Nonetheless, statistical analysis revealed significant differences in performance across the three competencies, with p-value of 0.0081, 0.0064, and 0.0077, respectively. In terms of challenges, four major themes emerged: academic difficulties, lack of a conducive learning environment, and logistical concerns. These findings offer valuable insights for educators seeking to enhance mathematics instruction. By nurturing students' motivation and providing consistent support, Project MEET demonstrates how targeted interventions can bridge learning gaps and foster improved performance in solving mathematical problems.

Keywords: Word Problem Solving, Learner Mastery Level, Mentoring and Engagement, Sequential Explanatory Mixed-Methods Design, General Mathematics, Least Learned Competencies

INTRODUCTION

Mathematics has become a significant hurdle for many students today, often perceived as an insurmountable challenge. For some learners, mathematics feels abstract and disconnected from their daily experiences, leading to confusion and a lack of motivation. This struggle negatively impacts not only their academic performance but also their confidence in school and beyond.

In today's world, where numeracy skills are crucial—from managing personal finances to excelling in STEM-related careers—making mathematics more accessible and engaging is essential. Many students lack a strong foundational understanding, resulting in frustration and even fear of the subject.

Mathematics is not merely about numbers; it is a discipline that sharpens logical thinking and enhances mental discipline. It serves as the backbone of various fields including science, technology, social studies, and even the arts. Thus, improving mathematics instruction is both an educational necessity and a societal priority.

To break down barriers to learning mathematics, educators must rethink how the subject is taught. This includes creating engaging, student-centered lessons and a classroom culture that supports risk-

taking and growth. With proper tools and encouragement, students can transform their view of mathematics—from a dreaded obstacle to a skill set that opens up opportunities.

At the core of effective teaching lies the mission to make learning meaningful. In the College of Teacher Education (CTEd), future educators are not only prepared to teach but to inspire, guide, and empower learners. A persistent challenge in math classrooms is students' difficulty with solving word problems—an essential skill that extends beyond mathematics to real-life decision-making.

This study, *Enhancing Mastery Level of Learners in Problem Solving*, aligns with CTEd's commitment to equipping future teachers with effective strategies for teaching problem solving. By bridging theory and practice, this research aims to develop instructional tools that will support both pre-service and in-service teachers in nurturing confident problem solvers.

The National Research Agenda for Teacher Education (NRATE) emphasizes the importance of strengthening teacher preparation, enhancing instructional effectiveness, and promoting innovative teaching methodologies. This study supports those goals by integrating 21st-century skills into mathematics instruction—particularly critical thinking, creativity, and problem solving. Moreover, it contributes to Sustainable Development Goal (SDG) 4, which advocates for inclusive, equitable, and quality education for all.

Empowering teachers with 21st-century skills leads to empowered learners. By rooting this study in both NRATE and SDG 4, the research underscores the importance of preparing teachers and students for a rapidly changing, complex world.

Problem solving is an essential competency in mathematics. As Greiff, Holt, and Funke (2013) argue, enhancing problem-solving skills remains a global challenge. Students need to apply math to real-world problems, but without these skills, mathematical knowledge often lacks relevance (Osman et al., 2018; Farida et al., 2018; Uyen et al., 2021).

In the Philippine context, the Mathematics Curriculum emphasizes the development of critical thinking and problem-solving abilities through five content strands: Numbers and Number Sense, Measurement, Geometry, Patterns and Algebra, and Statistics and Probability.

However, international assessments highlight the country's ongoing struggles. In the 2019 Trends in International Mathematics and Science Study (TIMSS), the Philippines ranked lowest among 58 participating countries in both mathematics and science. The Programme for International Student Assessment (PISA) 2022 also revealed a significant drop in student performance post-pandemic.

Local data reflects similar trends. According to Division Memorandum No. 334, s. 2023, the Division Contextualized Achievement Test results for Grade 10 students in Nueva Vizcaya show Mathematics with a Mean Percentage Score (MPS) of 67.11%, which—while above the division average—still indicates persistent learning gaps. Specific competencies such as solving problems involving measurements, understanding geometric properties, and illustrating probability remain least mastered.

Further, the National Achievement Test (2018–2019) showed that Grade 10 students at Aritao National High School had a low mastery in Mathematical Ability (Percentile Rank: 44.89), including those in STEM tracks.

Word problem solving remains one of the most challenging skills for students, requiring both mathematical and reading comprehension abilities. Students must interpret, analyze, and strategize based on the given information—a process where poor understanding significantly hinders performance.

To address this, Project MEET (Mathematics Mentoring and Engaging Timely help) aimed to provide focused, supportive, and engaging mentorship to students struggling with General Mathematics in Grade 11. The intervention included presentations, guided problem solving, and learning materials tailored to the needs of low-performing learners.

The curriculum in General Mathematics includes Functions and Graphs, Business Mathematics, and Logic, all of which involve extensive word problem solving. Diagnostic tests during the 2023–2024 first semester revealed the following low mastery rates: 31.79% (functions), 33.80% (rational equations/inequalities), and 52.7% (interest problems)—demonstrating the urgent need for intervention.

Mentoring, as defined by MENTOR (2010), is a structured and trusting relationship that enhances the mentee's academic and personal development. Studies by Petosa & Smith (2014) and Thompson & Kelly Vance (2001) confirm its positive impact on student achievement, particularly for at-risk learners. Anastasia et al. (2012) add that mentoring involves connecting a learner with a non-parental adult role model who provides support and encouragement.

Incorporating mentorship into mathematics education aligns with findings from Machera (2017), who noted that effective interventions promote self-direction, collaboration, and meaningful learning experiences. Engagement, motivation, and emotional support are key elements in improving learners' performance.

This study is also grounded in Polya's (1957) Problem-Solving Framework, which outlines four steps: understanding the problem, devising a plan, carrying out the plan, and reflecting on the solution. These steps will guide the design and evaluation of the intervention.

While much of the current research focuses on elementary and junior high school students, this study extends to senior high school learners, whose experiences during and after the intervention will be documented. A thematic analysis was employed to identify common challenges and improvements in problem-solving skills.

OBJECTIVES OF THE STUDY

The main goal of this study is to assess the effectiveness of Project MEET in improving students' mastery in solving word problems among grade 11 students at Aritao National High School.

Specifically, it aimed to:

1. determine the mastery level of the respondents in solving word problems involving functions and their graphs, rational equations and inequalities, and simple and compound interest before and after the implementation of Project MEET.
2. assess if there is a significant difference in the mastery level of the respondents in solving word problems involving functions, involving rational functions, rational equations and rational inequalities, and involving simple and compound interest before and after the implementation of Project MEET.
3. identifying the challenges faced by the participants during the implementation of Project MEET.

METHODOLOGY

The study employed a sequential explanatory mixed-methods design, which involves collecting quantitative data first, followed by qualitative data. In the quantitative part, the researcher used a one-group pretest-posttest design. A quasi-experimental method was employed. This means that the same group of Grade 11 respondents was assessed before and after the intervention, without a separate control group. The researcher made a 60-item test that was validated by the Subject Group Head in Science and Technology, Mathematics and Engineering (STEM) strand, Master Teacher I in Mathematics, and a teacher who has taught General Mathematics from the beginning of implementation of senior high school curriculum. The grade 11 Linux and Faraday majored in Home Economics (HE) and Information and Communication Technology (ICT) was given the pretest to find out their initial understanding of the enumerated three least learned competencies in General Mathematics. After, they participated in an intervention called Project MEET, which was designed to help improve their mastery level in solving word problems. Once the intervention was completed, the same students took a posttest to see if there had been any improvement in their performance.

To better understand the respondents' experiences, the qualitative phase came next. The researcher conducted an open-ended qualitative interview to know the challenges they faced during the intervention. These conversations provided valuable insights that helped explain the results of the tests, such as why some students improved more than others or what difficulties might have affected their learning.

By combining the structured measurement of quasi-experimental approach with the personal insights of qualitative data, this mixed methods design offered a fuller understanding of the effectiveness of Project MEET. The test results showed whether improvement occurred, while the interviews revealed the factors that influenced these outcomes.

Initially, a 60 – item test was validated by three validators who were the Subject Group Head in Science and Technology, Mathematics and Engineering (STEM) strand, Master Teacher I in Mathematics and a Teacher who teaches General Mathematics from the beginning of implementation of senior high school curriculum. Then, the validated test was pilot tested to the four Humanities and Social Sciences (HUMSS) classes. Due to the test's dichotomously scored items, the Kuder-Richardson Formula 20 (KR-20) was used to guarantee the research instrument's reliability. A very high degree of internal consistency

cy reliability is indicated by the calculated KR-20 value of 0.94. This suggested that the test's items were highly consistent in assessing the same underlying construct, namely students' mastery level in solving word problems. This level of reliability coefficient suggested that the test was reliable, has a little measurement error, and reliably captures the students' actual performance. The validity of the inferences made from the assessment results and made from the assessment results and the reliability of the data gathered are both supported this high degree of reliability.

After, a validated test was administered to the respondents to assess their mastery levels in solving word problems related to General Mathematics. This test focused specifically on three competencies that have been identified as the least mastered. The instrument was administered last August 14 – 15, 2025 to both sections of the Technical-Vocational Livelihood (TVL) strand.

Following the assessment, the respondents participated in Project MEET, an intervention designed by the researcher to enhance students' skills in solving word problems. The research process included administering a pre-test prior to the intervention and a post-test afterward to measure any improvements in mastery.

In addition to the quantitative assessments, qualitative data were gathered through interviews conducted with the respondents. These interviews will explore the challenges they faced during the intervention, providing deeper insight into their experiences and learning processes. This mixed-methods approach aims to provide a comprehensive understanding of the effectiveness of Project MEET in improving word problem-solving skills and to identify specific challenges that learners encountered along the way.

Sampling Procedure

With the result of the test score analysis stating that the learners of Home and Economics and ICT grade 11 had the lowest level of mastery in solving word problems, they will be the respondents in the said study. Purposive sampling is used in this study.

The grade 11 HE and ICT students will be chosen as respondents since they obtained low mastery levels along the three (3) least mastered competencies namely Solving Problems Involving Functions, Solving Word Problems Involving Rational Functions, Rational Equations and Rational Inequalities and Solving Word Problems Involving Simple and Compound Interest.

A total of 44 students served as respondents in this study from a former total of 60 students. Some of the learners transferred out, no longer participating due to family related issues and others insisted on working already rather than studying.

Research Instruments

To gather both quantitative and qualitative data, the study utilized a validated 60-item Word Problem Test in General Mathematics, designed to assess students' proficiency in three key competencies from the first semester curriculum. The test was reviewed and validated by three subject experts: the STEM Strand Subject Group Head, a Master Teacher I in Mathematics, and an experienced General Mathematics teacher. It was then pilot-tested on four HUMSS classes to ensure clarity and effectiveness. The test's internal consistency was measured using the Kuder-Richardson Formula 20 (KR-20), resulting in a high reliability coefficient of 0.94, which indicates excellent consistency and minimal measurement error. This confirmed the test's ability to accurately assess students' actual performance. Once finalized, the test was administered to the study's respondents, and their scores were interpreted using a five-point performance scale: Beginning, Developing, Approaching Proficiency, Proficient, and Advanced. This scale provided a clear framework for classifying learners' mastery levels, from those needing constant support to those who could independently solve complex problems. The test results were used to measure pre- and post-intervention mastery, assess statistical differences, and gather insights into learners' experiences during the implementation, supporting the study's overall objectives.

In this study, learners' mastery levels in solving word problems were assessed using a five-point performance scale. For the first learning competency—Solving Word Problems Involving Functions—and for the second and third competencies—Solving Word Problems Involving Rational Functions, Rational Equations, Rational Inequalities, and Simple and Compound Interests—the same interpretation matrix was applied. A mean score of 19.20 to 24.00 indicates an Advanced level, where learners exceed expectations and demonstrate deep understanding with independent and insightful application of concepts. Scores between 14.40 and 19.10 reflect a Proficient level, showing consistent understanding with mini-

mal support. Those scoring 9.60 to 14.30 fall under Approaching Proficiency, showing basic understanding but needing occasional help. A score between 4.80 and 9.50 suggests a Developing level, with partial understanding and frequent need for support. Lastly, scores from 0.00 to 4.70 indicate a Beginning level, where learners struggle significantly and require constant guidance. This scale served as the framework for interpreting student performance across the three key competencies. Open-ended qualitative interview was used as a tool to collect descriptive, in-depth responses on the respondents' experiences of participating in Project MEET. It will answer the challenges faced by the respondents during the intervention.

Data Gathering Procedure

Preparation Stage. In the first phase, the 60-item test was created according to the total number of hours that three learning competencies in word problem solving involving functions, involving rational functions, rational equations and rational inequalities and involving simple and compound interest had been taught. It was validated by the STEM head teacher in the Senior High School department, a colleague teaching the subject at the very start of the implementation of the STEM curriculum, the research coordinator and the master teacher in mathematics. The instruments were validated and reproduced. To check the reliability of the instrument, it was pilot tested to the four Humanities and Social Sciences classes.

To uphold ethical considerations, codes are used in place of names. Permission to conduct the study was requested from the Subject Group Head, Research Coordinator, Assistant Principal of the Senior High School, and the School Principal. A permission letter to conduct is prepared and submitted to the Division Office, DEPED Nueva Vizcaya.

Administration of Research Instruments. The researcher administered the research instruments upon the approval of the conduct of the research. A letter of consent was given to the parents of the respondents to ensure their voluntary participation in the study.

Pilot Testing. The validated test was pilot tested to the four Humanities and Social Sciences (HUMSS) classes for an hour allotted time. Scores were recorded and kept for future analysis. The time frame that the non-respondents determined the time the respondents took the pre-test and post-test. Due to the test's dichotomously scored items, the Kuder-Richardson Formula 20 (KR-20) was used to guarantee the research instrument's reliability. A very high degree of internal consistency reliability is indicated by the calculated KR-20 value of 0.94. This suggested that the test's items were highly consistent in assessing the same underlying construct, namely students' mastery level in solving word problems. This level of reliability coefficient suggested that the test was reliable, has a little measurement error, and reliably captures the students' actual performance. The validity of the inferences made from the assessment results and made from the assessment results and the reliability of the data gathered are both supported this high degree of reliability.

A project was proposed to the school to support learners in improving their mastery level in solving word problems in General Mathematics. It aimed to provide targeted interventions that enhance their problem-solving skills and overall mathematical proficiency. The proposal was reviewed and endorsed by the Subject Group Head and has received approval from the School Principal. A copy of this proposal was submitted to the district office and signed by the District In-Charge, indicating their support and acknowledgement of the project.

Project MEET was implemented after the respondents complete the pretest. It run for one semester, during which the respondents will be enrolled in the course subject.

Final Phase. In the final phase of the study, the instrument was administered for the post test. To ensure the validity of the test, it was administered two weeks after the intervention had been implemented. The collected data was analyzed and interpreted. The responses were organized, patterned and the results revealed the respondents' mastery level in the enumerated three learning competencies. The challenges faced during the intervention were identified and categorized into four (4) themes with corresponding subthemes.

The findings helped determine how effective the intervention was and provided insights on how to further support students in mastering word problems in General Mathematics specifically within the enumerated three learning competencies. Ensuring the respondents' rights, data integrity, and research credibility was upheld with ethical considerations. All personal information was anonymized to protect respondent's privacy.

FINDINGS

The findings are discussed in detail, presented in tables and supplemented with qualitative insights, all supported by relevant documentation to highlight their significance.

Problem 1. What is the mastery level of the respondents in solving word problem involving functions, involving rational functions, rational equations and rational inequalities, and involving simple and compound interest before and after the Project MEET?

Table 1. Mastery Level in Solving Word Problem Along with Learning Competency 1, 2 and 3 Before and After the Implementation of Project Meet

Learning Competencies	Tests	Mean Score	Mastery Level
Solving Word Problems Involving Functions	Pretest	9.16	Developing
	Post-test	11.07	Approaching Proficiency
Solving Word Problems Involving Rational Functions, Rational Equations and Rational Inequalities	Pretest	5.07	Developing
	Post-test	6.48	Developing
Solving Word Problems Involving Simple and Compound Interest	Pretest	6.80	Developing
	Post-test	8.30	Approaching Proficiency

To determine the mastery level of the respondents in word problem solving involving functions, involving rational functions, rational equations, and rational inequalities and involving simple and compound interest mean scores were computed and presented in table 1.

Table 1 reveals that the mean percentage score for pretest was 21.20, which falls under the low mastery category. Similarly, the average percentage score for the post-test was 25.90, indicating it also remains within low mastery category. These were the results of the 60-item validated test.

As seen in the table above, the mean score during the pretest is 9.16 which is categorized as Developing in mastery level while after the intervention, the mean score for the post-test is 11.07 which fell under the Approaching Proficiency mastery level.

This implies that there is a little significant difference on the mastery level in solving word problems along with the first competency: solving word problems involving functions. The most significant changes include the decrease in beginning learners and rise in approaching proficiency learners and proficient learners. This indicates that several learners moved from struggling with constructing mathematical models to represent real-life situations using functions to solve problems involving functions to demonstrate stronger understanding. The emergence of an advanced learner highlights that the intervention not only helped the least, lost and last learners improve but also pushed higher-achieving learners towards excellence.

Beyond the numbers, this data tells a story of growth, resilience and the power of timely academic support. Each learner represents a journey – some took small but meaningful steps forward, while other made leaps that exceeded expectations. The increase in students reaching proficiency and advanced levels reflects their hard work, the effectiveness of the intervention and the dedication of those guiding them.

As seen in the table above, most learners before the intervention were under developing mastery level with a mean score of 5.07 for competency number two. A little mean score increased which was 6.48 after the intervention, but the result stayed at the developing mastery level.

This implies that there is a little significant difference on the mastery level in solving word problems along with the second competency: solving word problems involving rational functions, rational equations and rational inequalities. This shift suggests a positive impact from the intervention, as more learners moved forward mastery. The most significant improvement in each respondent's mean score is in approaching proficiency category, which increased from 7% to 27%. This means several learners gained deeper understanding and confidence in their skills. The decrease in developing learners shows that struggling learners improved, although they may still need further support.

However, the absence of advanced learners suggests that while intervention helped learners strengthen their foundational knowledge, it may not fully push them towards excellence. Additional enrichment strategies might be needed to encourage higher order thinking and deeper application of concepts.

These numbers reflect more than just academic progress. It indicates the story of learners overcoming learning hurdles. The shift from developing to approaching proficiency to proficient is a testament to their effort and perseverance, as well as the effectiveness of the intervention in providing timely and meaningful support.

As shown in the table above, the pretest mean score is 6.80 while the post-test mean score is 8.30 which fell under the category developing and approaching proficiency mastery level for competency number three. There are 7 % for beginning learners, 55% for developing learners, 34% for approaching proficiency learners and 5% for proficient learners with no advanced learners before the intervention. After the intervention, there was a sudden shift in developing learners from 55% to 34%, approaching proficiency learners from 34% to 41%, proficient learners from 5% to 16% and lastly, the advanced learners from 0% to 2%. Most learners were at the beginning level before the intervention. After the intervention, the number of developing learners dropped, while more learners moved to a higher level and 2% reached the advanced level.

The data shows a clear improvement in student learning, with noticeable movement from lower to higher proficiency levels. The reduction of developing learners from 55% to 34% indicates that struggling learners were able strengthen their skills. Meanwhile, the increase in proficient learners and the emergence of an advanced learners, which did not exist before, highlight that some learners did not exist before, highlight that some learners not only improved but reached higher levels of mastery.

However, the unchanged number of beginners reminds us that not all learners progress at the same pace, and some may need more targeted, individualized support. The intervention has sparked improvement, but learning is an ongoing process. The challenge is to sustain these gains and continue fostering an environment where every student regardless of their starting point and will feel capable of success.

Table 2. Summary of Mastery Level in Solving Word Problem Along with the Three Learning Competencies Before and After the Implementation of Project Meet

Learning Competency	Tests	Mean Score	Mastery Level
Solving Word Problems Involving Functions, Rational Functions, Rational Equations and Rational Inequalities, Simple and Compound Interest	Pretest	21.02	Developing
	Post-test	25.84	Approaching Proficiency

Before the interventions, the respondents pretest mean score is 21.02 which is categorized under the developing mastery level while after the intervention, the respondents' posttest mean score fell under the Approaching Proficiency mastery level. Before the intervention, no students were in proficient and advanced levels. The majority (70%) were at the developing level, while 27% were approaching proficiency and 25% were still at the beginning level.

After the intervention, there was a clear shift upward: The beginning category was eliminated (from 25% to 0%), meaning all struggling students were improved. The developing group shrank from 70% to 48%, indicating many students moved up. Approaching proficiency increased from 27% to 39%, showing more learners gained a stronger grasp of the concepts. Proficient learners emerged (11%) and 2% even reached an advanced level, which was previously unattained.

The intervention led to significant improvement across all levels. The most notable achievement is the complete elimination of the beginning group, meaning even the lowest-performing learners showed progress. Additionally, the decrease in developing learners and increase in approaching proficiency level suggest that students gained more confidence and competence in the subject.

The emergence of proficient (11%) and advance (2%) learners is a major success, as it shows that some students not only improved but also achieved higher levels of mastery. This suggests the intervention was not just about remediation but also about pushing students towards excellence.

Beyond the percentages, it showed a transformation. Learners who once struggled at the beginning level are now confidently moving forward, proving that with the right support, no one must stay behind. The growth in approaching mastery and proficient levels reflects their hard work, resilience and effectiveness of the intervention.

Perhaps the most inspiring part is the emergence of advanced learners. It was proof that some learners did not just improve, they thrived. While challenges remain, the overall trend is a testament to the power of guidance, motivation and a learning environment that encourages every learner to grow. The

next step is to sustain this progress and finding ways to push more students towards mastery and excellence.

The results of this study, which categorize learner's mastery level in solving word problems under low mastery, align with the findings of the PISA 2022 assessment. PISA revealed that Filipino students struggle significantly with mathematical problem-solving, with 80% scoring below level 2 proficiency, indicating difficulties in applying basic concepts to real-world problems. This parallel underscore the need to address the gaps in learners' problem-solving skills and supports the relevance of this study in contributing effort aimed at improving mathematical competencies.

Problem 2. Is there a significant difference in the mastery level of the respondents in solving word problems involving functions, involving rational functions, rational equations and rational inequalities and involving simple and compound interest before and after the Project MEET?

To determine if there is a significant difference in the mastery level along with the three-word problem solving learning competencies before and after the Project MEET, the respondents' t-value and p-value results were computed and presented in table 6.

Table 3. Analysis of Difference between Mastery Levels of the respondents in Solving Word Problem in terms of Competency 1, 2 and 3

Competencies	Test	Mean	Mean Difference	Computed <i>t</i>	p value	Remarks
One (1)	Pretest	9.16	1.91	-2.78	0.0081	Significant
	Posttest	11.07				
Two (2)	Pretest	5.07	1.41	-2.87	0.0064	Significant
	Posttest	6.48				
Three (3)	Pretest	6.80	1.5	-2.79	0.0077	Significant
	Posttest	8.30				

The pretest mean score of learners was 9.16, while their post-test mean score increased to 11.07 for competency one. This shows a mean difference of 1.91, indicating an overall improvement in learners' performance after the intervention.

The computed t-value is -2.78, and the p-value is 0.0081. Since the p-value is less than 0.05, the result is statistically significant, meaning the improvement in scores is unlikely to have by chance.

The data suggests that the intervention had a positive impact on student learning. The mean difference is 1.91 signifies a measurable improvement in performance, with students scoring higher in post-test than in pretest. The negative t-value (-2.78) simply reflects the direction of comparison of the pretest and post-test, that the p-value (0.0081) is statistically significant. This means that the observed improvement is meaningful and not due to random variation. The intervention was effective in enhancing learners' mastery of the subject matter.

These numbers represent more than just scores. It reflects the learning journey of real learners. At the start, many of them faced difficulties, as seen in their pretest scores. But after receiving support, guidance and encouragement, they showed clear improvement.

However, growth does not stop here. Some learners improved, but others may still need more guidance. The challenge now is to keep this momentum going, ensuring that every learner continues to develop their skills and reach their full potential.

The significant improvement in learners' performance after the implementation of Project MEET reflected how strategic interventions can enhance students' problem-solving abilities. Through mentoring and structure support, the intervention helped learners' meaningful connections between abstract concepts and practical application, leading to better understanding and mastery of word problems. These gains are also consistent with research by Laciste & Capua (2021), who highlighted the importance of structural interventions in improving senior high school students' problem-solving proficiency.

For competency two, the pretest mean score of learners was 5.07, while their post-test mean score increased to 6.48. This shows a mean difference of 1.41, indicating an overall improvement in learners' performance after the intervention.

The computed t-value is -2.87, and the p-value is 0.0064. Since the p-value is less than 0.05, the result is statistically significant, meaning the improvement in scores is unlikely to have by chance.

The data suggests that the intervention had a positive impact on student learning. A 1.41 increase in their average score may seem small, but for these learners, it could mean grasping concepts that once felt out of reach. Learners were able to understand, formulate and solve real-life problems involving rational functions, rational equations and rational inequalities.

The success of significant findings of the said intervention was aligned with Thompson and Kelly-Vance (2001), who emphasized that mentoring programs can truly support struggling students, helping them stay on track and avoid falling behind. Similarly, Anastacia et al. (2012) described mentoring as building a meaningful connection between a young person and supportive, nonparental adult who can guide and encourage them. In Project MEET, this kind of guidance created a safe space where learners felt supported, allowing them to engage more confidently with word problems and gradually build both skill and self-belief.

For competency three, the pretest mean score of learners was 6.80, while their post-test mean score increased to 8.30. This shows a mean difference of 1.5, indicating an overall improvement in learners' performance after the intervention.

The computed t-value is -2.79, and the p-value is 0.0077. Since the p-value is less than 0.05, the result is statistically significant, meaning the improvement in scores is unlikely to have by chance.

The data suggests that the intervention had a positive impact on student learning. A 1.5 increase in their average score may seem small, but for these learners, it could mean grasping concepts that once felt out of reach. Learners were able to understand, investigate, analyze and solve problems involving simple and compound interest.

The encouraging results after implementing Project MEET showed that learners became more confident and capable in solving word problems. They were not just guessing or following steps but they were actually understanding what the problems were asking. This reflected what Raoana (2016) pointed out that when students are given the right strategies, there were better able to make sense of word problems and eventually work their way toward the correct solution. Through mentoring, guided practice, and a supportive environment, the intervention helped learners feel less overwhelmed and more equipped to tackle math with clarity and purpose.

Problem 3. What are the challenges faced by the respondents during the intervention?

To identify the challenges faced by the respondents during the intervention an open-ended qualitative interview was conducted. A total of 15 participants were interviewed. The responses were divided into themes and subthemes to identify the category of common responses and insights from the respondents. Below is the summary of themes and subthemes taken from the responses of the learners from their responses.

Table 4. Analysis of Respondents' Responses Regarding the Challenges Faced During the Intervention

Themes	Subthemes
Academic challenges	<ul style="list-style-type: none"> • Problem-solving difficulties • Indeterminate problems with rational equations
Issues with creating a conducive environment	<ul style="list-style-type: none"> • Challenges in attention and concentration • Difficulties with noise
Logistical challenges	<ul style="list-style-type: none"> • Challenges in transportation due to late sessions

The first challenge identified is related to the topics tackled, as some respondents have struggled with some mathematical concepts in problem solving. Under the academic challenges, two specific things were mentioned by the respondents. First, there were the problem-solving difficulties. Three respondents had stated that they have problem solving difficulties, such as the following:

“nahihirapan po ako mam sa pagsagot” (Participant 4)

“yes, mam kasi minsan nahihirapan ako sa mga solve at hindi ko naiintindihan minsan ang mga discussions” (Participant 5)

“meron po mam. May mga ilang challenges rin po ako Nahihirapan po ako sa pagsolve ng mga problems.” (Participant 6)

Meanwhile, two respondents expressed their difficulties with rational equations:

“Mam yung rational equations po. Nahirapan po kasi ako dun kasi medyo di ako marunong magdivide.” (Participant 14)

“Sa rational po mam nahirapan po ako magdivide.” (Participant 15)

The second challenge identified was on issues with creating a conducive environment. Some respondents interviewed had experienced difficulties in focusing on learning due to identified distractions, such as lack of attention and concentration, and difficulties with noise.

“Naranasan ko po yung mahirap ako makinig dahil nadidistract ako sa lahat ng mga bagay kahit anong mga nakikita ko.” (Participant 10)

“Dahil sa naguguluhan yung pag-iisip ko mam. Dami kong iniisip na kung ano.” (Participant 10)

“Naguguluhan ako sa mga maingay na mga kasama.” (Participant 5)

“Naguguluhan ako mam minsan at nalilito mam sa mga kuwan.” (Participant 4).

The third problem identified was on logistical challenges. While some respondents have experienced academic challenges and issues with creating a conducive environment, some faced challenges with the schedule and transportation. Two respondents had experienced challenges in transportation due to late sessions:

“mas agahan po sana katulad po ngaun mam na may mga vacant po kami mam na 4-5.” (Participant 14)

“Mas agahan ng oras ang Project MEET mam kasi may mga vacant period po kami mam mga 4-5.” (Participant 15)

While some of the respondents experienced challenges, some of the learners enjoyed the intervention with no significant challenges encountered, and thus did not have any complaints or sufferings during the intervention. Instead, they commented on the intervention being a reliable learning support.

“Wala naman mam. Kasi para sa akin talagang magandang ideya yung Project MEET” (Participant 1)

“Ahh mam wala naman po akong problema. Actually, maganda yung ganon pong project” (Participant 12)

“Wala naman po mam. Kasi mas mas importante pong makilahok ka sa Project MEET.” (Participant 11).

One participant, on the other hand, have pointed out a strong mathematical background, therefore, encountering no challenge during the conduct of the project:

“Wala naman pong naencounter na ganun na problema po. Kasi ahm, pagdating po sa Math kasi parang yun yung pinaka skill na nadevelop ko nung bata pa ako.” (Participant 13)

“Siyempre as of parents na Math major.” (Participant 13)

The identified challenges encountered by the respondents during the intervention significantly affected the overall conduct of Project MEET. While the intervention significantly contributed to the success of increasing the mastery level of the respondents in solving word problems across the three identified learning competencies – as attested by several students – there were still obstacles that emerged. Some of the respondents recommended that the sessions should begin earlier to allow them to return home sooner, reducing concerns related to safety and travel time.

Another unavoidable concern was school disruptions due to weather conditions. Due to multiple typhoon warnings, several sessions had to be done online. This posed a challenge for respondents with connectivity issues, limiting their participation. Some learners had difficulties accessing since they do not have WIFI or data connectivity. However, many of the learners appreciated being able to re-access the recorded sessions on different platforms such as YouTube, allowing them to learn at their own pace, at their most convenient time.

Furthermore, to better understand the concerns on transportation, triangulation was employed through interviews, observations, and test results. Learners shared that it was difficult getting home after late sessions, especially for those who lived far from school, or those that do not have regular transportation. This was also observed in regular class attendance, where some students arrived late or missed sessions entirely. Correspondingly, post-test results revealed that learners who experienced transportation

difficulties generally showed lower academic gains. This draws out the impact of logistical struggles on the respondents' involvement and performance during the conduct of the intervention.

At a deeper level, the struggles of senior high school students in solving word problems reflect more than just gaps in mathematical knowledge. They reveal a disconnect between understanding numbers and making sense of real-life situations. Laciste and Capua (2021) emphasized that learners often know how to perform operations, yet they stumble when asked to interpret scenarios and turn them into solvable equations. This suggests that what students truly need is not just more practice with computations, but meaningful support in developing critical thinking and problem-translation skills. Ultimately, this calls to a shift in teaching approaches to help students connect mathematics to everyday life.

CONCLUSIONS

1. The implementation of Project MEET positively impacted the mastery level of Grade 11 learners in solving word problems across the three competencies in General Mathematics. Mean scores improved in all areas, within the first and third learning competencies which were the solving word problems involving functions and involving simple and compound interests, moving up from Developing to Approaching Proficiency. However, while scores in solving word problems involving rational functions, rational equations and rational inequalities also improved, they remained within the Developing level, indicating continued learner difficulty particularly with division and multiplication skills. Overall, the results highlight the effectiveness of mentoring and engagement strategies in enhancing student learning and mastery.
2. The study revealed clear improvements in how learners solved word problems across all three competencies after the intervention. Their performance showed meaningful progress, pointing to the positive impact of the strategies used. These results suggest that a well-planned and supportive intervention can make a difference in helping students build stronger mathematical skills and confidence.
3. During the interviews, 15 students opened up about their experiences with Project MEET. While many appreciated the support and felt it helped them learn better, they also shared some struggles. A few found it hard to fully understand tough topics like rational equations. Others mentioned challenges with their learning environment and late timing sessions. These honest reflections show that while the program made a positive difference, there's still space to make it even better the next time.

RECOMMENDATIONS

1. Since the study found positive results which elevate learners' mastery level in solving word problems, it is recommended that the intervention, Project MEET be sustained and implemented also to other grade levels. Mentoring, making engaging lessons, and timely supporting learners must continue to support learners who struggle in their lessons. Moreover, in order to further enhance students' mathematical thinking, instruction may integrate more contextualized and real-life problem-solving activities.
2. Since the intervention made a significant difference in learners' mastery level of word problems, it would be beneficial to continue and refine Project MEET. The school may consider adapting and integrating it into teaching strategies to help support the learners who struggle in math.
3. The school may consider setting up regular sessions to give additional instructional time for learners who struggle with mathematical word problems. These sessions should be scheduled in a way that does not conflict with students' travel time, so they can attend without worrying about getting home late. A well-structured and sequenced lesson flow can help students understand and retain key concepts. Moreover, the learners who excel in math can be tapped as peer tutors. Encouraging them to support their classmates not only strengthens the learning of those being helped but also deepens the understanding of peer tutors themselves. This kind of collaborative learning can make interventions more engaging and effective for everyone. For future implementations, it would be beneficial to have consistent and extended instructional time, improved integration of ICT tools, and collaboration with English teachers to support students' language and problem-solving skills.

4. Future researchers may consider looking into how students' language skills, like reading comprehension, affect their ability to understand and solve math word problems. Many learners struggle not just with the numbers but with making sense of the problem itself. It would also be helpful to take into account students' performance in prerequisite subjects, such as their past math classes, to see how earlier learning influences their current understanding. Designing interventions that support both language and math skills could lead to better outcomes, especially for students who find word problems particularly challenging.

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LIVED EXPERIENCES OF ILOCANO TEACHERS IN ARIZONA: BASES FOR DEVELOPING CULTURAL EXCHANGE POINTERS FOR PROSPECTIVE J-1 TEACHERS

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ABSTRACT

This study examines the lived experiences of J-1 Ilocano teachers in Arizona, United States through a transcendental phenomenological approach. Specifically, this study delves into their personal and professional experiences and the challenges they encounter as J-1 teachers. Purposive criterion sampling was used to ensure that the participants meet the requirements of teaching in the U.S. specifically in Arizona under a J-1 or H-1B visa and are Ilocano. The participants' length of teaching experience in Arizona ranges from two months to four years. Findings indicate that the participants' personal experiences revolve around the themes of support systems and racial encounters while their professional experiences delve on professional adversities and cultural identity, language and adaptation, professional fulfillment, and support system. Specific challenges include addressing students' needs, misalignment of academic specialization and assigned teaching subjects, parental attitude and engagement, and student behavior. In light of these findings, Cultural Exchange Pointers for Prospective J-1 Ilocano Teachers is crafted to assist Ilocano teachers participating in the J-1 Program in settling to their new environment, promoting cross-cultural understanding, and enhancing their professional integration.

Keywords: lived experiences, J-1 Ilocano teachers, personal and professional experiences, challenges

INTRODUCTION

Participating in the J-1 Teacher Exchange Visitor (J-1TEV) program in the United States is one of the current trends among Filipino educators. This program was started by the U.S. The Department of State gives educators the chance to broaden their perspective on the world and improve their professional knowledge. Participants improve their teaching techniques and are exposed to a variety of pedagogical approaches through hands-on involvement in the American school system. Whether they decide to return to the Philippines or continue teaching overseas, their experiences also help them grow professionally over the long run.

Participating in the J-1TEV program exposes Filipino educators to diverse cultures and lifestyles, broadening their horizons and promoting intercultural understanding. Both the educators and their host communities in the US gain from these experiences, which frequently result in significant cross-cultural connections and partnerships. This phenomena therefore affects not only specific participants but also more general facets of Filipino culture and the country's economy (Aguila, 2015).

Foreign instructors can live and work temporarily in the United States while sharing their knowledge and cultural history with local students through the J-1TEV, also known as Bridge USA. The program was created in 1961 with the goal of fostering global understanding and collaboration via cultural interaction and education (Bridge USA, 2021-a). In order to help close the workforce gaps, J-1TEV participants are frequently deployed to rural school districts in the United States, where teacher shortages are common (Carver-Thomas & Darling-Hammond, 2017; Gross, 2018; Showalter et al., 2017; Tran & Smith, 2019).

This exchange program is part of a larger effort that dates back to 1945, when U.S. Senator J. William Fulbright proposed using funds generated from the sale of surplus war materials to finance educational exchange programs (Ralph, 1987 as cited by Ralph, 2024). The legislative framework was officially enacted on August 1, 1946, paving the way for international educators to share their knowledge and cultural background with American students (Bridge USA, 2021-a).

The J-1 Exchange Visitor Visa is specifically designated for individuals taking part in approved exchange programs, including students, researchers, and professionals. In response to the persistent teacher shortage in the U.S., the program has drawn thousands of qualified educators worldwide, including Filipino teachers, who see the opportunity as a means to improve both their personal and professional lives (Carver-Thomas & Darling-Hammond, 2017; Furuya et al., 2019; Ospina & Medina, 2020; Modesto, 2020). In 2021 alone, approximately 300,000 teachers from over 200 countries participated in the program (USA, Bridge, 2021-b).

Economic factors play a significant role in the migration of Filipino professionals, including educators. According to the Philippine Statistics Authority (2024), the average annual family income in the country is approximately PhP 307,019.00 (\$5,524.00), while average annual household expenses amount to PhP 228,080.00 (\$4,103.63). Additionally, 18.1% of Filipinos lived below the poverty line in 2021, with a household of five needing at least PhP 12,030 (\$244) per month to meet basic needs. In contrast, Filipino teachers in Arizona under the J-1TEV program can earn significantly higher salaries, such as a physics teacher earning approximately \$53,000 annually, making overseas employment a compelling option.

However, Filipino educators participating in the J-1TEV program encounter numerous challenges despite the financial advantages. The application process alone is rigorous, as there are multiple steps undertaken such as securing approvals from the Philippine Overseas Employment Administration, attending interviews at the US Embassy, and obtaining the necessary visa (Ontiveros, 2017; Trimbach, 2017). The moment they arrive in the US, they must navigate cultural adjustments, homesickness, and the uncertainty of their employment status when the program ends.

What further complicate their experience are the personal and professional obstacles they meet along the way. It can be extremely difficult to cope with new living arrangements, long-distance family relationships, and variations in educational policies and methods (McNulty, 2015; Fillpic Sterle et al., 2018; Modesto, 2020). Significant professional obstacles are also presented by linguistic limitations, disparities in classroom management approaches, and unfamiliar administrative expectations (Dias-Lacy & Guirguis, 2017; Dumlao & Mengorio, 2019; Ospina & Medina, 2020).

International teacher mobility has grown significantly, with Filipino educators participating actively in exchange programs such as the J-1 Teacher Exchange Visitor (J-1TEV) Program. The J-1TEV provides foreign teachers opportunities to teach in accredited U.S. primary and secondary schools while engaging in cultural exchange activities.

For Filipino teachers, particularly Ilocanos, the program presents opportunities for financial improvement, professional growth, and cultural exposure. However, their experiences are not without challenges. Cultural dissonance, homesickness, professional adjustment, and even racial encounters characterize their journeys abroad.

In Arizona, where teacher shortages prevail, J-1 Filipino teachers contribute substantially to educational outcomes. Understanding their lived experiences provides valuable insights for developing cultural exchange guidelines for future participants, ensuring smoother transitions and better adaptation.

This study aligns with the United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), and SDG 10 (Reduced Inequalities), as well as the internationalization thrusts of Philippine educational institutions like DepEd and Nueva Vizcaya State University.

STATEMENT OF THE PROBLEM/OBJECTIVES

Overall, this study explored the lived experiences of J-1 Ilocano teachers in Arizona. Specifically, it aimed to:

1. determine the lived personal and professional lived experiences of the J-1 Ilocano teachers in Arizona
2. determine the challenges encountered by the participants while teaching in Arizona
3. propose cultural exchange pointers may be derived to improve the teaching experiences and address the challenges of prospective J1 teachers

METHODOLOGY

To better understand the human experiences of the J1 instructors in Arizona who are the subject of the investigation, the qualitative research approach was used in this study.

Qualitative research uses a variety of factual materials, including textual and narrative data, to analyze complex human actions and circumstances in order to better comprehend the topic under study. The goal of qualitative research is to better understand underlying causes, viewpoints, motivations, and social phenomena by collecting and evaluating non-numerical data. Additionally, it highlights the participants' subjective experiences and interprets meanings in natural environments using methods like as case studies, interviews, and observations (Christou, 2025).

This study used phenomenology method. This is how a group of persons experiencing the same phenomenon are described by a phenomenology design, which was the design used for this study. Hermeneutical phenomenology and transcendental phenomenology are the two categories of phenomenological study. In hermeneutical phenomenology, researchers both interpret and describe the experiences of participants, whereas in the latter, they are required to bracket their personal experiences in order to avoid the influence of preconceived notions (Creswell & Poth, 2018).

Arizona, a state in the southwestern United States, is where the study was carried out. This study included the J-1 Ilocano teachers who are presently teaching in Arizona, USA. Seven (7) participants who were selected for the study using a criterion sampling technique were invited to participate. The following were considered in selecting the participants in the study: Filipino J1 educators, Ilocano, are working in Arizona, have stayed in the US for the last five years, and hold only Filipino citizenship. Ensuring that the participants meet these requirements warrant that even though the data collected were variable, the underlying phenomenon was always present. The participants of the study are composed of 4 males and 3 females. One of the participants is a doctorate degree holder, three are master's degree holders, and three are bachelor's degree holders. All of them are teaching in Arizona, three are in Tucson while four are in Phoenix. The participants are all Ilocanos and have been teaching in Arizona for 2 months to 4 years during the conduct of the study.

Structured interviews were conducted to capture both personal and professional experiences. Interviews were recorded, transcribed, and analyzed thematically. The participants' personal and professional experiences as J1 Ilocano instructors in Arizona were covered in the first section of the interview. Part 2 on the other hand, focused on the most difficult challenges they have encountered while living and teaching in the Arizona.

The study employed various statistical methods to analyze and interpret qualitative data effectively.

Frequency Analysis – This method determined the recurrence of specific themes, phrases, or experiences mentioned during interviews.

Pattern Coding – Related responses were categorized into thematic groups, allowing for the identification of overarching concepts (Saldaña, 2016).

Thematic Analysis – Emerging themes were examined and refined to ensure they aligned with the study's objectives (Grbich, 2013; Patton, 2015; Saldaña, 2016).

Confidentiality, informed consent, and voluntary participation were strictly adhered to throughout the research process.

Findings

This chapter presents the findings of the study, beginning with a restatement of the research problem. Given the qualitative nature of this research, data were gathered from in-depth interviews and personal narratives and these are presented through direct narratives from the participants.

Table 1. Thematic categories of participants' accounts on their personal experience while teaching in Arizona

Thematic Category	Specific Experience
Support System	Cultural Adaptation, Institutional and Community Support, Resilience and Coping Mechanism
Racial Encounters	Hostility, Microaggressions and Racism

The personal experiences of J-1 Filipino teachers in Arizona highlight themes of support system and racial encounters.

Support System. The responses of the participants demonstrate the various forms of support systems they experienced while teaching in Arizona. Specifically, they experience support in adapting to the new culture, support from the institution and the community, and support to build their resilience and coping mechanism. The responses of the participants show how they move through their life as international teachers with the help of these support systems.

Racial Encounters. Responses of the participants reveal the racial experiences they went through as J-1 Filipino teachers in Arizona. As Filipino teachers in a new culture and work environment, they come across both supportive and difficult experiences related to race and ethnicity. There are times they feel included and valued, while there are moments they feel discriminated. Their stories shed light on how racial dynamics affect their careers and personal lives, influencing their identity and sense of belonging in the U.S.

Professional Adversities and Cultural Identity. The study's participants describe the challenging cultural and professional environments they encounter while working as teachers in Arizona. Their stories emphasize the challenges and possibilities of being an international educator.

Language Adaptation and Professional Fulfillment. Experiences of Filipino J-1 teachers in Arizona reflect issues related to linguistic barriers, cultural adaptation, and pedagogical adjustments.

Support System. The experiences shared by the J-1 Filipino teachers in Arizona who are participants in this study highlight the critical role of support systems in their professional and personal adjustment. Moving to the US to teach presents various challenges such as cultural adaptation, classroom management, and administrative expectations. Nonetheless, the existence of supportive administrators, fellow teachers, and structured resources significantly affect their ability to thrive in the US education system.

The study of Ingersoll and Strong (2011) suggests that mentorship and peer support play a crucial role in reducing teacher burnout and increasing job satisfaction, particularly for foreign educators. Téllez and Manthey (2015) likewise state that administrators who give priority to inclusivity and provide necessary resources foster a work environment which makes international teachers feel valued and empowered. Supportive administrators who address teacher concerns, provide resources, and encourage professional growth create a positive teaching environment that enhances teacher retention and effectiveness (Darling-Hammond, 2017).

The diverse challenges faced by the participants which are broadly categorized into eight themes such as addressing students' needs, misalignment of academic specialization and assigned teaching subjects, parental attitude and engagement, student behavior, communication, cultural disparities, and mental and emotional toll.

The Cultural Exchange Pointers for Prospective J-1 Ilocano Teachers in Arizona are established based on the findings of this study, which explored the lived experiences, challenges, and adaptation strategies of Ilocano teachers in Arizona under the J-1 Visa Exchange Visitor Program. The study brings attention to pressing topics in which international teachers need assistance in terms of cultural integration, workplace norms, financial security, and institutional policies in the U.S. education system.

CONCLUSIONS

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

1. The personal experiences of J-1 Ilocano teachers in Arizona highlight themes of support system and racial encounters while their professional experiences encompass professional adversities and cultural identity, language and adaptation, professional fulfillment, and support system.
2. The challenges encountered by the participants as J-1 Ilocano teachers in the US are categorized into the themes of addressing students' needs, misalignment of academic specialization and assigned teaching subjects, parental attitude and engagement, student behavior, communication, cultural disparities, and mental and emotional toll.
3. Based on the findings of this study the Cultural Exchange Pointers for Prospective J-1 Filipino Teachers in Arizona have been formulated.

RECOMMENDATIONS

Based on the findings and conclusions in this study, the following recommendations are proposed:

1. J-1 Ilocano teachers may think about the following to make their experience more rewarding: cultivate relationships with coworkers, administrators, and local communities to facilitate cultural adaptation; seek assistance, record incidents, and advocate for inclusivity when confronted with racial challenges; take part in professional development to improve classroom practice and feedback; work with local teachers to facilitate a smoother transition; take on leadership roles and pursue mentorship and counseling to promote professional growth and fulfillment.
2. To effectively overcome obstacles, J-1 Ilocano teachers can think about the following: implementing culturally responsive discipline strategies and working with guidance counselors to manage student behavior; attending training on differentiated instruction, classroom management, and interventions for struggling learners to address students' diverse needs; conducting regular parent-teacher conferences, workshops, and proactive communication strategies to improve parental engagement; participating in language enhancement programs, peer coaching, and interactive speaking activities to minimize language barriers; and networking with other J-1 teachers to ease cultural disparities. However, schools can also offer financial literacy seminars, peer support groups, and well-being programs to help instructors deal with family separation and financial responsibilities, as well as subject-specific training and peer mentorship to help teachers adapt to curriculum mismatches.
3. In addition to subject-specific training and peer mentorship to assist teachers in adjusting to curriculum mismatches, schools can also provide financial literacy seminars, peer support groups, and well-being programs to help teachers cope with family separation and financial responsibilities.
4. Similar studies may be conducted in the future by researchers who take into account other factors not discussed in this study. They might also think about assessing how the Cultural Exchange Pointers are being applied.

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READING AND WRITING COMPETENCY OF TECHNOLOGICAL-VOCATIONAL LIVELIHOOD GRADE 11 STUDENTS: BASIS FOR LEARNING INTERVENTION

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ABSTRACT

This study determined the Reading and Writing Competency of Technology Livelihood Grade 11 students as basis for learning intervention, School Year 2024-2025. Quantitative study design and descriptive correlational method were employed to evaluate the students' competency level in reading and writing. This was conducted in Bangbang National High School and Gohang National High School in the municipality of Hungduan and Banaue, Ifugao. Total enumeration was used taking the whole population of Grade 11 Senior High School with 35 TVL students. The reading and competency level of the respondents were measured using the researcher-made test which consisted 60 items. It found that the overall competency level of the respondents in Reading and Writing, described as average, reflects varying levels of proficiency across specific areas. Respondents demonstrate high competency in hypertext and intertext and critical reading, showcasing strengths in navigating digital texts and analyzing information critically. However, the respondents have average performance in assertions and counterclaims and low competency in resumé writing, college admission applications, employment applications, and office correspondence which highlight areas that need improvement. Based from the significant findings of the study, Learning Activity Sheets were developed in order to improve the competencies of the Grade 11 students in Reading and Writing specifically on writing resumé, application for college admission and for employment and various forms of office correspondence.

Keywords: Reading and writing, Technological-Vocational Livelihood students, writing

INTRODUCTION

The national scenario on the competency level of Reading and Writing among Senior High School (SHS) students in the Philippines reveals significant challenges and areas needing improvement. The K to 12 Senior High School curriculum includes a core subject dedicated to Reading and Writing Skills, aiming to develop students' abilities to read and write across various text types beyond literary genres. The curriculum emphasizes critical reading strategies, understanding text-context relationships, and writing critiques and academic texts. Despite this, the gap between curriculum goals and actual student performance suggests a need for enhanced instructional strategies and support to improve literacy outcomes.

Reading and writing are the two most important abilities that people possess and hone. Gaining these abilities helps people succeed in daily life, especially students. For both educators and students, a strong foundation in reading and writing requires a great deal of commitment. As students move up the educational ladder, so does their proficiency in reading and writing. This highlights the need of basic literacy for everyone.

English language learners need to focus on developing their seven macro skills: listening, speaking, reading, writing, viewing, representing, and mediating.

Another receptive skill that helps people understand written messages is reading. It entails deciphering symbols and comprehending their significance. Proficiency in reading is essential for both everyday communication and academic performance (Barrot, 2016).

Writing is a useful ability that enables people to put their ideas into words. To effectively communicate ideas, this entails adopting suitable language, proper syntax, and sentence structure (Barrot, 2016).

A major component of the Senior High School curriculum is Reading and Writing, which teaches pupils how to write and read in genres other than poetry, fiction, and drama. It serves as an excellent example of several essential components, including: 1) developing students' reading skills through a thorough discussion of reading and thinking strategies across text formats; 2) teaching them to identify text and context connections in a range of reading resources; and 3) introducing them to writing as a supplement to reading. By exposing students to scholarly and professional literature with practical applications in a real-world setting, the course seeks to enhance their reading and writing habits (Ocampo, 2018).

Lack of general knowledge prevents students from writing to the intended benchmark since they are unable to expand and elaborate on the issues raised in their writing. Another evident problem kids face is language accuracy, which includes spelling, punctuation, morphology, and syntax. For university students, reading and writing have thus become major issues (Totto & Ramos, 2021).

Being a Grade 11 teacher at Bangbang National High School, the researcher found that reading and writing difficulties are becoming more common in the schools and that these pose a severe issue for students in Grade 11. It was observed that students find it difficult to read or understand some unfamiliar terms as they find difficulty in expressing themselves in writing. They had a habit of syllabifying words before they could speak them correctly. Similarly, most of them could hardly write and convey concepts, and their handwriting was hard to read.

During the third quarter, these four learning competencies are included in Reading and Writing subject of the Grade 11 students: identify the context in which a text was developed, explain critical reading as a form of reasoning, formulate evaluative statements about a text read: assertions about the content and properties of a text read; and counterclaims in response to claims made in a text read, and identify the unique features of and requirements in composing professional correspondence. Based from the pre-test given, these four learning competencies came out to be the least mastered competencies of the students which means that the students find difficulty along these areas.

Statement of the Problem

The study aimed to determine the Reading and Writing Competency of Technology Livelihood Grade 11 students as basis for learning intervention for the school year 2024-2025.

Particularly, the study found answers to the following research questions:

1. What is the competency level of the respondents in reading and writing in terms of hypertext and intertext, critical reading, assertions and counterclaims, and resumé, application for college admission and for employment and various forms of office correspondence?
2. Based from the significant findings of the study, what learning intervention could be initiated?

METHODOLOGY

A quantitative study design was employed to evaluate the students' proficiency in reading and writing. The process of gathering and evaluating numerical data is known as quantitative research. It can be applied to evaluate causal linkages, make predictions, identify trends and averages, and extrapolate findings to larger populations (Bhandari, 2020).

The quantitative design was used in this study since numerical data were collected from the respondents' tests results on the teacher-made tests in writing and reading which was eventually analyzed.

Descriptive correlational method was used in the study. A quantitative research design known as descriptive correlational research seeks to characterize the properties of variables and investigate the connections between two or more variables without changing them or establishing cause-and-effect correlations. Combining the descriptive and correlational aspects, it gives a thorough explanation of variables or phenomena and analyzes their relationships, usually using statistical techniques like correlation coefficients to gauge the direction and strength of relationships (QuestionPro, 2024; SurveySparrow, 2024).

Without intervention or experimental manipulation, researchers use this method to gather data that provides a thorough snapshot of the variables of interest. They then examine patterns or associations between these variables as they naturally occur in real-world settings (QuestionPro, 2024; SurveySparrow, 2024).

This study was conducted in Bangbang National High School and Gohang National High School in the municipality of Hungduan and Banaue, Ifugao. These two schools are selected since the said schools are both offering TVL strand and these are well-established schools in the province.

Bangbang National High School. This is one of the smallest secondary schools in Ifugao with a total enrolment of the two hundred twenty one learners from grade 7 to the grade 12 for the current school year 2022-2023. It has a total land area of 24,147 sq donated by Mr. Paul Ananayo and Mr. Henry Dulnauan. The school was established in 2019 with Republic Act Number 9622 dated June 22, 2009.

This school is implementing the K-12 Curriculum using the Most Essential Learning Competencies (MELC) from the Junior High School and grades 11-12 in the Senior High School level. The Senior High offers the TVL strand with carpentry and dressmaking as the specialization.

This school is situated on top of a mountain at sitio Hagonghong, Barangay Bangbang in the municipality of Hungduan. It is 2 kilometers away from the municipal hall of Hungduan and 2.3 kilometers away from the National Highway. The school is accessible to any type of vehicle passing through a barangay single lane road with a 200 meters dirt road before reaching the school.

Th school has garnered several awards in the division level like second place in speech choir contest, champion in division wrestling contest, sabayang pagbigkas (division champion), chess girls (champion) and other prestigious awards.

Every year, the school produces TVL National Certificate II holders in carpentry and dressmaking.

Gohang National High School. This is one of the two public secondary schools in Banaue, Ifugao. It is located between the municipality of Banaue and Hungduan, particularly at the old missionary airstrip of Barangay Gohang approximately 6 kilometers from the heart of the town of Banaue and 1 kilometer from the national road at Upper Gohang.

The schools' operation started in 1991 as an annex of Banaue National High School located at Duglig, Banaue, Ifugao. It traces its roots through the efforts of the BNHS principal, Mr. Raymundo Madangen, other DepEd officials and the LGU.

In 1993, Congressman Benjamin B. Cappleman filed House Bill No. 10019 aimed at separating the annex from its mother school. On June 1994 under RA 7758, the school was established- Gohang National High School was given its own budget.

At present, the school has land area of 4,000 sq. meter. It has a present population of 380 students, 12 teachers and is managed by a secondary school principal.

The school is offering Technical-Vocational Livelihood. The school has 5 teachers and 86 students in the Senior High School.

The research was conducted to the TVL grade 11 Senior High School students who came from Bangbang National High School and Gohang National High School in the municipality of Hungduan and Banaue, Ifugao. The whole population of grade 11 Senior High School students in the target schools was considered in this study. They came from the Academic Track, specifically the Technical Vocational Livelihood (TVL) Track.

The 35 participants of the study were chosen via total enumeration.

The study used total enumeration in selecting the respondents since the study aimed to measure the reading and writing competency of Technological-Vocational Livelihood grade 11 students basis for learning intervention.

Total enumeration, also known as complete enumeration or census, refers to a sampling technique where every member of a defined population is included in the study. This method is often used when the population size is small enough to allow for comprehensive data collection. Total enumeration ensures that all individuals or units within the population are accounted for, providing complete data that can lead to accurate conclusions about the entire population. It involves collecting data from every unit in the population, eliminating sampling errors associated with other sampling methods. Total enumeration is particularly useful in studies where specific characteristics of the entire population need to be analyzed (Australian Bureau of Statistics. (2023).

The primary means of gathering data for the research was through teacher-made assessments. The study was carried out using the following tool. Teacher-Made Test. was used to measure the competency level of the respondents in their Reading and Writing. This was composed of 60 items covering the competencies in the Reading and Writing subject, 30 items are design for reading and 30 items are designed for writing. The competencies included the Most Essential Learning Competencies of the Senior High School Curriculum.

To arrive at a verbal description of each item, the following arbitrary numerical guide for the reading as well as the writing competency was used.

Prior to the administration of the questionnaire, this was subjected to validation and pilot testing. Reliability analysis was performed through a pilot test with 0.86 using the Cronbach's Alpha. To arrive at a verbal description of each item, the following arbitrary numerical guide for the reading as well as the writing competency was used.

In gathering the data in the study, the researcher first asked permission from the school heads for the conduct of the study. Then, the researcher determined the number of TVL students included as respondents.

Before administering the teacher-made test, this was validated by experts and had the pilot testing. In the validation process, the experts made suggestions that made the teacher-made test better. The researcher returned to the members of the panel four to five times to ensure the validity of the test.

The researcher incorporated all the suggestions made by the members of the panel. After incorporating all the suggestions on the teacher-made test, this was administered to all the respondents.

The teacher-made test was administered to the respondents personally and this was collected immediately.

The result was retrieved, tallied, and treated using the appropriate statistical tools.

In conducting the study, ethical consideration was observed. Permission from authorities was sought. Permission from parents was also asked. Honesty and confidentiality were strictly observed.

The statistical tool used was mean which was used to determine the competency level of the respondents in Reading and writing.

FINDINGS

The results of this study are presented in this chapter. In order to structure the findings of the study, the presentation starts with a description of the issue and moves on to the identification of the data management tools, the findings and their discussion, tables, and relevant supporting documents.

Table 1. Competency Level of Respondents in Reading and Writing

Competency	Mean	Level
Hypertext and intertext	10.51	High
Critical reading	9.14	High
Assertions and counterclaims	6.17	Average
Resumé, application for college admission and for employment and various forms of office correspondence	4.57	Low
Overall	30.40	Average

Table 2 shows that the competency level of the respondents in reading and writing using means has an over-all mean of 30.40 which is described as average.

The average level of the respondents in reading and writing using means is composed of the following means hypertext (10.51) which is described as high; critical reading (9.14) which is described as high; assertions and counterclaims (6.17) which is described as average; and resumé, application for college admission and for employment and various forms of office correspondence (4.57) which is described as low.

The result of the study means that the Grade 11 students in Bangbang National High School and Gohang National High School in the municipality of Hungduan and Banaue, Ifugao have average competency level in their Reading and Writing subject. This implies that most of the respondents have average understanding of their lessons in Reading and Writing.

According to a close examination of the results of the study, the average score of 10.51 on the hypertext and intertext is considered high, indicating that respondents have strong abilities to navigate and comprehend hypertext, effectively use digital texts, interact with hyperlinks, and integrate information from multiple sources—all of which are critical competencies in today's digital learning environments, where hypertext is common.

Additionally, the high mean score indicates that responders are highly competent in comprehending and applying intertextuality and hypertext. This is consistent with studies showing that by enabling learners to access information dynamically, hypertext environments improve comprehension and en-

gagement. Said and Mansyur (2019) assert that by offering numerous avenues for investigation and education, hypertext promotes a greater comprehension of literature.

The study's findings are supported by Miri et al. (2025), who found a strong positive correlation between online reading engagement—which involves navigating hypertext environments—and EFL learners' motivation and reading comprehension. This study emphasizes how dynamic interaction with digital texts improves comprehension and learner engagement. Additionally, Konstantinidou et al. (2023) showed that by including students in dynamic text interactions, scenario-based reading-to-write interventions that mimic real-life hypertextual navigation and intertextual relations greatly enhance writing quality.

The idea that hypertext environments improve comprehension by allowing users to dynamically explore semantic and contextual connections is supported by Burghardt and Liebl (2020), who cited intertextual relations and highlighted how hypertextual links between texts facilitate richer semantic understanding.

Further, 9.14 is the average score for critical reading. The respondents' mean score of 9.14, which is also considered high, shows that they have great critical reading skills. This suggests that people are capable of effectively analyzing, evaluating, and assessing texts—a skill required for both academic performance and making informed decisions. Their ability to engage with texts critically shows that they have a strong reading foundation, which can help them in their future studies.

Additionally, the mean score shows that responders have a high level of proficiency in critical reading. The idea that critical reading entails text analysis and evaluation, which is crucial for academic performance, lends credence to this study. Critical reading abilities let students to interact with texts more deeply, which improves comprehension and analytical skills, as the DepEd Tambayan module emphasizes (DepEd Tambayan, 2022).

With an average mean score of 6.17 for assertions and counterclaims, respondents appear to have a reasonable understanding of how to make assertions and recognize counterclaims in their writing. They may need to practice effectively articulating and disproving opposing viewpoints, even though they are able to make claims. Making compelling arguments and taking part in academic discussions require this skill.

Competencies in creating resumes, applying for employment and college entrance, and various forms of office communication received a low score of 4.57, indicating that respondents struggled much in these important areas. Respondents who have a low resume writing score lack the skills necessary to effectively design resumes that highlight their achievements, qualifications, and fit for available employment. This can be the consequence of a failure to comprehend proper formatting, the use of action verbs, or the customization of resumes for a particular industry.

The findings indicate a stark disparity in the respondents' writing and reading skills. High levels of critical reading and hypertext proficiency demonstrate that students are ready to traverse digital texts and engage with content in an informed manner. Poor performance on resumes, college applications, job applications, and other office letter formats, together with bad performance on assertions and counterclaims, point to particular deficiencies that could obstruct effective writing skills.

The findings about the average reading and writing skills of respondents, particularly in hypertext, critical reading, assertions and counterclaims, resumes, college admission and employment applications, and various types of office correspondence, can be supported by recent studies that highlight the significance of these competencies in educational contexts.

For instance, a study by Salmerón et al. (2006) highlights that comprehension in hypertext environments requires cognitive processes similar to those in linear texts, but also requires additional skills to effectively organize information. This is in line with the responders' outstanding performance in this area.

While students demonstrate strong abilities in navigating and comprehending hypertextual digital content, Gonzales-Lima's qualitative study from 2023 shows that they struggle to produce coherent and effective written outputs, such as resumes and formal applications, pointing to specific gaps in practical writing skills.

Additionally, the respondents' high critical reading score (9.14) demonstrates their ability to analyze and evaluate texts effectively. Aziz et al. (2024) found that even after being taught critical academic reading skills, students often still have difficulty evaluating texts, highlighting the importance of honing

these skills. The findings show that although children may struggle in some areas, they generally have a solid foundation in critical reading.

The respondents' moderate comprehension of statements and counterclaims is indicated by their average score of 6.17. According to Velayati et al. (2017), students have trouble using critical thinking skills when they read. This includes having trouble expressing claims clearly and identifying counterarguments. This suggests that while students are reasonably skilled at making assertions, they could perform better when it comes to discussing opposing views.

The average mean score indicates that respondents have a moderate comprehension of assertions and counterclaims. This suggests that although they are able to articulate statements, they could do better in identifying and clearly expressing counterarguments. According to Velayati et al. (2017), teaching students how to interact with opposing ideas is crucial since it can improve their ability to write argumentatively.

According to Lachner (2023), recognizing counterclaims demonstrates critical thinking and enhances arguments. However, many students find it difficult to communicate and refute opposing views, highlighting the need for specialized teaching to enhance these abilities.

Although students are capable of formulating claims, Barnet and Bedau (2006) point out that they frequently struggle to identify counterarguments and create strong rebuttals, indicating a moderate level of competency and the need for instructional strategies that emphasize the creation of counterclaims.

Significant difficulties were encountered by the respondents in recognizing and effectively utilizing resumes, applications for college admission and employment, and various forms of office correspondence in their writing, as evidenced by the low mean score for these items (4.57). The results of this study are consistent with a study by Nguyen (2020) that shows that many students have trouble incorporating resumes, applications for college admission and jobs, and other types of office correspondence into their arguments because they have a limited vocabulary and inadequate language proficiency.

In business writing assignments like resumes and workplace communication, Bonala (2019) found that many students had trouble with proper structure, grammatical errors, vocabulary use, and organization, which affects their overall writing ability. Writing successful business documents, such as applications and formal letters, is challenging for students who struggle with grammar and organization (Smithson & Clark, 2022).

Resume, college admission and employment applications, and other office correspondence: The average score for competencies in writing resumes, college admission and employment applications, and various office correspondence formats suggests a lack of proficiency in these crucial areas. According to this score, respondents may have trouble producing these important documents, which are necessary for both academic and professional success.

According to the mean score, respondents could find it difficult to create resumes that effectively highlight their experiences and qualifications. A well-written resume is crucial for creating a good first impression on prospective employers, claims Zimmaro (2016). The low score suggests that comprehension of the essential components of a successful resume, including formatting, language use, and content customization to particular job descriptions, has to be improved. Editorial Team of Fast Company. (2022) emphasizes the growing significance of simplicity and achievement evidence in resumes, pointing out that many applicants are unable to adequately highlight measurable accomplishments, which reduces the impact of their resumes.

Furthermore, the low level of skill in college entrance forms suggests that responders might not adequately showcase their personal remarks and academic accomplishments. According to research, applications that are well-prepared greatly increase the likelihood of being accepted into competitive programs (Indeed, 2024). According to the results, respondents might gain from advice on how to best express their talents and match their applications to the requirements of the institution.

The average score for office correspondence suggests that writing official letters, memos, and emails is a challenge for professionals. For business contacts to remain professional and clear, effective office correspondence is essential. Misunderstandings and poor communication within businesses may result from subpar performance in this area.

A mean score near the middle indicates that respondents are not meeting acceptable standards in these competences, per the rules of item analysis. An item mean close to the midpoint indicates that respondents are not strongly endorsing the skills required for effective communication in these formats (Assessment Systems, 2025). This implies that there is significant room for improvement.

Overall, the results show places for development in assertions, counterclaims, resumes, applications for jobs and college admission, and various types of office letters, while also revealing strengths in hypertext and critical reading competencies. By filling in these gaps with focused educational interventions, respondents' general reading abilities can be improved, better equipping them for future academic challenges.

According to Murray (2025), crafting a compelling resume summary and highlighting measurable accomplishments are essential for standing out in competitive job markets. Further, the low competency level indicates that respondents may struggle with presenting their academic achievements, extracurricular activities, and career goals effectively in applications. Research highlights that college and job applications require clear communication of one's strengths and alignment with the institution or employer's expectations (Indeed, 2024). A lack of these skills can hinder opportunities for admission or employment. A low score in this area suggests difficulties in professional communication, such as writing memos, emails, or formal letters. Effective office correspondence requires clarity, proper tone, and adherence to professional standards. Poor performance in this area could lead to miscommunication in workplace settings.

The findings from the study on reading and writing competencies among respondents are supported by current research that emphasizes the importance of hypertext navigation, critical reading skills, understanding assertions and counterclaims, and effectively writing résumé, application for college admission and for employment and various forms of office correspondence in academic contexts. Addressing the identified gaps through targeted interventions can enhance overall literacy outcomes for students.

Based from the significant findings of the study, among the four competencies in reading and writing, it was found out that the Grade 11 TVL students incurred low competency level along résumé, application for college admission and for employment and various forms of office correspondence. With this, Learning Activity Sheets along these areas are hereby developed.

CONCLUSIONS

Based from the findings of the study, it was found out that the overall competency level of the respondents in Reading and Writing, described as average, reflects varying levels of proficiency across specific areas. Respondents demonstrate high competency in hypertext and intertext and critical reading, showcasing strengths in navigating digital texts and analyzing information critically. However, their average performance in assertions and counterclaims and low competency in résumé writing, college admission applications, employment applications, and office correspondence highlight areas that need improvement. These findings suggest the need for targeted interventions to enhance practical writing skills and argumentation abilities to achieve a more balanced literacy competency. Based from the significant findings of the study, a Learning Activity Sheets was developed in order to improve the competencies of the Grade 11 students in Reading and Writing specifically on writing résumé, application for college admission and for employment and various forms of office correspondence.

RECOMMENDATIONS

It is hereby recommended that the teachers may regularly assess students' progress in reading and writing through formative assessments and provide timely feedback. This will help identify ongoing challenges and allow for adjustments in instructional strategies as needed; develop an integrated curriculum that combines reading and writing instruction with real-world applications. Incorporating assignments that require students to draft résumés, college admission essays, and professional correspondence can provide valuable hands-on experience; and provide more learning activities on writing résumé, application for college admission and for employment and various forms of office correspondence. The teachers may disseminate the developed Learning Activity Sheets to all Grade 11 students in order to polish their competencies on writing résumé, application for college admission and for employment and various forms of office correspondence. To increase respondents' competencies in reading and writing, other researchers could conduct a similar study with other variables like textual evidence, eight patterns of paragraph development, and others that are not included in the present study.

The Department of Education can look into the curriculum which can include more exercise on writing resumé, application for college admission and for employment and various forms of office correspondence. The developed learning activity sheet can be disseminated and utilized by the students in school to improve the reading and writing competency of the students.

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