

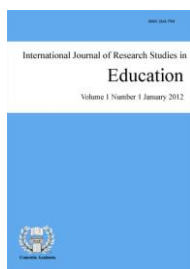
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Executive Editor

ijr.edu@gmail.com

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Decision making practices as determinants of employees' emotional intelligence and organizational commitment: The case of the Nueva Vizcaya Electric Cooperative (NUVELCO)

Manangkil, Hamill Ray J.

Nueva Vizcaya State University, Philippines

Castriciones, Serapio O. 

Nueva Vizcaya State University, Philippines

Agustin, Arnel A.

Nueva Vizcaya State University, Philippines (draaagustin777@yahoo.com)



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Abstract

This study examined the organization development (OD) practices and human resource management (HRM) systems of Nueva Vizcaya Electric Cooperative and their relationship with organizational integrity. Specifically, it assessed the extent of implementation of OD practices across the dimensions of personnel, structure, strategy, change management, technology, empowerment, work ethics, goal setting, products and services, and quality of work life; evaluated HRM practices in terms of staffing, performance appraisal, career development, incentives and rewards, human resource development, compensation and benefits, and employee-management relations; and determined their correlation with organizational integrity, particularly in ethical leadership, transparency and accountability, compliance with laws and regulations, and community engagement. Employing a descriptive-correlational research design, data were collected from regular and permanent employees selected through multi-stage sampling using stratified and simple random sampling techniques. A validated and reliable survey instrument was utilized, and data were analyzed using weighted mean and Pearson product-moment correlation at a 0.05 level of significance. Findings revealed that NUVELCO's OD practices ($M = 4.49$), HRM practices ($M = 4.42$), and organizational integrity ($M = 3.60$) were all rated Very Good, indicating strong organizational systems and generally favorable ethical standards. Correlation analysis further showed significant positive relationships between OD practices and organizational integrity ($r = 0.628$), HRM practices and organizational integrity ($r = 0.712$), and OD practices and HRM ($r = 0.694$), suggesting that strengthened organizational systems contribute substantially to ethical behavior, transparency, accountability, and organizational credibility. Based on these findings, a holistic OD intervention framework was developed to strategically align OD and HRM practices toward reinforcing organizational integrity, improving workforce engagement, and sustaining long-term organizational effectiveness.

Keywords: human resource management, organization development practices, organizational integrity

Decision making practices as determinants of employees' emotional intelligence and organizational commitment: The case of the Nueva Vizcaya Electric Cooperative (NUVELCO)

1. Introduction

In today's rapidly evolving global business landscape, effective decision-making has emerged as a critical determinant of organizational success. Modern workplaces are continually exposed to economic, social, and technological shifts that require agility and strategic thinking from every member of an organization. The quality of decision-making—from executive levels down to front-line employees—plays a pivotal role not only in influencing operational outcomes but also in shaping the personal well-being and professional commitment of the individuals involved. This is especially true in service-oriented institutions such as electric cooperatives, where employees' daily choices directly impact service delivery, stakeholder relationships, and community welfare. At the local level, particularly in the context of electric cooperatives in the province of Nueva Vizcaya, decision-making takes on a multifaceted importance. These cooperatives serve as lifelines for economic and social development in rural communities, where access to electricity defines opportunities for progress. Employees in this cooperative are regularly confronted with high-stakes decisions—ranging from technical troubleshooting and customer relations to administrative and community-led initiatives. Despite their indispensable role, limited attention has been given to understanding how the decision-making styles and practices of these employees influence their emotional intelligence and organizational commitment. This absence of localized studies creates an urgent need for empirical research that investigates the impact of decision-making on both personal and organizational outcomes in the unique setting of rural electric cooperatives.

The significance of this study lies in its attempt to explore an under-examined intersection between decision-making practices, emotional intelligence (EI), and organizational commitment within the context of electric cooperatives—vital organizations in rural electrification and development. Employees who practice sound decision-making can better manage emotional stress, collaborate effectively, and foster a heightened sense of belonging and loyalty to their institutions (Gaines & Jermier, 2021). Similarly, emotionally intelligent individuals are better positioned to make decisions that consider both rational analysis and the human element, thereby contributing to a more cohesive and resilient organization (Salovey & Grewal, 2020). Despite the relevance of these constructs, there remains a noticeable gap in studies contextualized within the operations of electric cooperatives in the Philippines. Existing research has mostly focused on employee performance and corporate governance but has seldom examined the psychological dimensions—such as emotional intelligence and commitment—that underpin effective service delivery (Cruz & Reyes, 2022). This study thus seeks to address the research gap by specifically analyzing how decision-making practices influence emotional and organizational dynamics among employees in electric cooperative of Nueva Vizcaya.

One of the primary research projects gaps this study aims to address is the scarcity of empirical work linking decision-making styles with emotional intelligence and organizational commitment in public utility sectors, particularly electric cooperatives. Earlier studies have predominantly investigated decision-making in the context of private corporations or urban-based enterprises (Santos & Laxamana, 2021). However, rural electric cooperatives possess distinct organizational cultures and employee roles shaped by community relationships, public accountability, and government regulations. Furthermore, while emotional intelligence has been extensively explored in pedagogical and healthcare settings, its relevance to cooperative-based industries has not been fully examined. Emotional intelligence contributes to how employees manage workplace challenges, deal with customers, and uphold cooperative values (Ahmed & Mudasi, 2023). Yet, studies focusing on how this emotional competency is affected by the nature and style of decision-making remain limited.

Another gap lies in understanding the role of organizational commitment in service-oriented, semi-public institutions. Prior studies have observed that commitment levels in such institutions are deeply influenced by job satisfaction, leadership, and work environments (Escobar & Pineda, 2022). However, few have linked commitment to the decision-making processes employees experience or enact in their roles. This study thus fills an important niche by examining this dynamic interplay in electric cooperatives—entities whose effectiveness relies profoundly on the dedication of their workforce. The conduct of this research is aligned with the United Nations Sustainable Development Goals (SDGs), specifically SDG 7 (Affordable and Clean Energy) and SDG 8 (Decent Work and Economic Growth). Electric cooperatives are on the frontlines of achieving SDG 7, particularly in rural areas where infrastructure development is ongoing. Well-functioning cooperatives with emotionally intelligent, committed employees can more effectively meet community energy needs. Additionally, investing in employee development through emotional and decision-making skill enhancement promotes SDG 8 by supporting sustained, inclusive, and productive employment. Moreover, this study contributes to SDG 4 (Quality Education) through knowledge generation and dissemination. The findings of this research will provide a basis for training modules and professional development programs that aim to build emotional and organizational capacities among employees. Such programs align with the SDG call for lifelong learning opportunities for all (United Nations, 2023).

On the national level, the National Higher Education Research Agenda (NHERA) highlights the need for research that advances knowledge and responds to societal needs. This study addresses the NHERA's priority area on "governance and public service efficiency" by exploring how emotional and organizational dimensions are influenced by internal decision-making practices (CHED-NHERA, 2021). Within the institutional context, the research aligns with the Nueva Vizcaya State University (NVSU) Research Agenda, pursuant to its mandate to conduct transformative studies that benefit local communities and industries. The proposed investigation supports the agenda's focus areas of rural development and organizational behavior (NVSU Research Development Office, 2022). Similarly, the College of Arts and Sciences (CAS) Research Agenda of NVSU advocates interdisciplinary approaches to human development studies. Through its multidisciplinary lens, this research strengthens the CAS objective of producing evidence-based insights on societal and organizational dynamics (CAS-NVSU, 2023). Moreover, the study is premised on several theoretical assumptions. First, it assumes that decision-making practices—whether autocratic, consultative, or participative—directly shape the emotional experiences and behavioral outcomes of employees. It also assumes that employees with higher levels of emotional intelligence are more capable of interpreting and responding to workplace challenges and decisions with greater autonomy and responsibility.

At the organizational level, the study assumes that the type and quality of decisions employees are empowered to make affect their sense of belonging and loyalty, hence influencing organizational commitment. Higher commitment is often manifested in reduced turnover intention, improved performance, and stronger alignment with institutional values (Zhao & Liang, 2021). Operationally, the study assumes that employees in the electric cooperative under review have varying degrees of decision-making autonomy, emotional intelligence, and organizational commitment. The study also assumes that these variables can be measured through a carefully designed research instrument based on established scales (Abdullah et al., 2022). The researcher's personal observations and preliminary inquiries revealed several pressing concerns that motivated the conduct of this study. Employees in the electric cooperative often work under intense operational pressures, including emergency response during power outages, customer complaints, field assignments, and administrative compliance with regulatory agencies. These challenges can compromise both their emotional balance and sense of connection to their organization.

Another recurring problem is the lack of empowerment among staff in some electric cooperatives, particularly in decision-making. Employees who are not given opportunities to contribute to organizational decisions may feel undervalued, leading to emotional exhaustion and diminished commitment (Bartolome & Dizon, 2023). Furthermore, the nature of electric cooperative work, which combines public service and technical skills, often results in role conflict and job-related stress—conditions where emotional intelligence becomes crucial for coping

and collaboration (Rivas & Nazareno, 2022). Lastly, the unpredictable and resource-limited context of rural cooperatives magnifies the need for sound decisions that align with institutional goals and community expectations. The mismatch between organizational demand and employee capacity has led to a research priority to understand how enhancing internal decision-making capacities can foster not only employee well-being but also organizational sustainability.

This study aims to contribute significant insights into the relationship between decision-making practices, emotional intelligence, and organizational commitment within the electric cooperative of Nueva Vizcaya. By addressing critical research gaps, aligning with national and global development agendas, and responding to observed workplace challenges, the research holds potential not only for theoretical contribution but also for practical organizational transformation. Ultimately, this investigation stands to support the creation of empowered, emotionally intelligent, and highly committed workforces—key drivers of community-centered development.

2. Related Literature

This research investigation is grounded on three interrelated theories: Herbert Simon's Decision-Making Theory (1947), Daniel Goleman's Emotional Intelligence Theory (1995), and Meyer and Allen's Organizational Commitment Theory (1997). Together, these theories provide a comprehensive framework for understanding how administrators' decision-making practices influence employees' emotional intelligence and organizational commitment. Simon's theory highlights the pivotal role of timely and accurate decision-making in achieving organizational goals. Goleman's theory emphasizes how individuals' ability to manage and harness emotions affects their behavior and interpersonal relationships in the workplace. Meanwhile, Meyer and Allen's Three-Component Model explain how employees develop emotional attachment, a sense of obligation, and considerations of cost in relation to their commitment to the organization. First, the Decision-Making Theory by Herbert Simon (1947) underscores the integral nature of decisions within an organization. It posits that poor or delayed decisions can impede the attainment of organizational objectives, while sound and timely decision-making can enhance operational effectiveness and employee engagement. In the context of electric cooperatives, this theory frames administrators' decision-making practices as a key factor influencing workplace dynamics and service delivery.

Second, the study draws on Daniel Goleman's (1995) Emotional Intelligence Theory, which emphasizes that individuals can recognize, understand, and regulate their own emotions while managing the emotions of others. The theory identifies five core dimensions—self-awareness, mood management, self-motivation, awareness of others, and managing relations—which shape employees' interpersonal effectiveness, problem-solving abilities, and adaptability in organizational settings. Finally, the research is also anchored on the Organizational Commitment Theory by Meyer and Allen (1997), as cited by Gumiran (2023), which conceptualizes commitment in three dimensions: affective, continuance, and normative commitment. This framework provides insight into how employees' emotional attachment, perceived costs of leaving, and sense of obligation influence their loyalty, engagement, and sustained performance within the organization. By integrating these three theories, the study establishes a holistic foundation to analyze the relationships among administrators' decision-making practices, employees' emotional intelligence, and organizational commitment, offering a framework to understand behavioral and organizational outcomes in electric cooperatives.

Decision-making practices in organizations reflect the ways in which administrators choose, implement, and evaluate actions in response to internal and external demands. A recent stream of research emphasizes that these practices are not monolithic; instead, they are usefully distinguished into adaptive, innovative, routine, and participative decision-making dimensions. The adaptive dimension involves decision-makers responding to changing conditions by adjusting established procedures or modifying choices in real time. For example, in the context of crisis response, decision-makers may adopt adaptive strategies to navigate uncertainty (Shen, 2020). The innovative dimension captures decisions aimed at generating novel solutions or creating change – rather than simply adjusting existing ones. In dynamic business environments, organizations that support innovative

decision-making can sustain performance and develop competitive advantage (Padmawidjaja, Sutrisno, Ardyana, Istiatin, & Wijayadne, 2022). The routine dimension refers to decisions that follow established patterns, standard operating procedures, and well-known alternatives—these decisions are efficient and low in ambiguity, but may lack flexibility or responsiveness to new challenges. Finally, the participative dimension is concerned with how decision-making includes, engages, or shares authority with stakeholders or employees; research evidences that participative decision-making supports creativity, voice behavior, and cognitive flexibility among employees (Kwon & Kim, 2025).

Each of these dimensions offers distinct implications for organizational outcomes. Routine decisions provide stability and efficiency, but may risk inertia if over-relied upon. Adaptive decisions promote responsiveness in shifting environments but demand flexible cognitive and procedural resources. Innovative decisions—while riskier—can be the driver of transformational change and long-term sustainable performance. Participative decisions matter for organizational culture, employee commitment, and psychological ownership; for instance, employees involved in decision-making are more likely to develop voice behavior and commitment (Ahmed & Siddiqui, 2021). In sum, a well-rounded decision-making practice in organizations may require a balanced mix of routine consistency, adaptive flexibility, innovative foresight, and participative inclusion. Recognizing and managing these dimensions allows administrators to align decision-making practices with strategic objectives, institutional values, and employee engagement in a meaningful way. Another variable of this research investigation is emotional intelligence (EI) which is increasingly recognized as a critical set of skills for individuals operating in organizational environments, enabling them to recognize, regulate, and leverage emotions—both their own and those of others—to optimize performance, relationships, and adaptability (Van der Zee & Bakker, 2022). In the workplace, high EI fosters greater resilience, stronger interpersonal connections, and enhanced capacity to respond to dynamic circumstances (Smith & Jones, 2023). Five core dimensions underpin this construct: self-awareness, mood management, self-motivation, awareness of others, and managing relations with others.

Self-awareness refers to an individual's capacity to monitor and recognize their own emotional states in real time, along with an understanding of how those emotions shape thoughts, behaviors, and interactions (Brown & Davis, 2021). Employees with strong self-awareness are better able to anticipate emotional triggers, adjust responses accordingly, and maintain emotional equilibrium in complex settings. Mood management (or emotional regulation) involves the ability to modulate, retrain, or shift one's emotional state—calming oneself when agitated, sustaining positive affect, or redirecting destructive moods into constructive channels (Taylor et al., 2024). Effective mood management has been shown to reduce workplace stress and counter burnout. Self-motivation is the dimension in which individuals harness internal emotional resources to persist toward goals, maintain enthusiasm independent of external rewards, and rebound after setbacks (Johnson & Nguyen, 2022). Emotionally self-motivated employees align their personal aspirations with organizational objectives, enhancing engagement and performance. Awareness of others—often called empathy or social awareness—represents the capacity to interpret accurately the emotional cues, concerns, and motivations of colleagues or stakeholders (Lee & Kim, 2023). This awareness supports effective collaboration, conflict avoidance, and adaptive communication. Finally, managing relations with others is the interpersonal application of emotional intelligence: using emotional understanding to build trust, influence outcomes, navigate conflict, and foster productive relationships across organizational levels (Evans & Clark, 2021).

Together, these five dimensions form a holistic framework for emotional intelligence: the intrapersonal skills (self-awareness, mood management, self-motivation) and the interpersonal capabilities (awareness of others, managing relations). In work environments—especially those subject to frequent change, decision-making demands, and team interdependence—competency across all five dimensions enables employees to interpret decisions not just as directives, but as relational and emotional processes. This, in turn, supports stronger commitment, smoother organizational adaptation, and an emotional culture that aligns individual behavior with institutional goals. On the other hand, organizational commitment as a research variable of this study represents the psychological attachment of employees to their organization and reflects the extent to which they identify with organizational goals, values, and objectives (Meyer & Allen, 1997; as cited in Gumiran, 2023). It is a critical

determinant of employee behavior, including engagement, retention, and performance. Contemporary research underscores that organizational commitment is multidimensional, typically categorized into three distinct but interrelated components: affective, continuance, and normative commitment (Meyer & Allen, 1997).

Affective commitment refers to an employee's emotional attachment to, identification with, and involvement in the organization. Employees with high affective commitment remain with an organization because they genuinely want to, driven by loyalty, shared values, and satisfaction derived from work (Lee & Park, 2021). Studies indicate that affectively committed employees demonstrate higher levels of discretionary effort, cooperation, and organizational citizenship behavior, which ultimately enhance productivity and organizational effectiveness (Khan, Rehman, & Riaz, 2022). Continuance commitment represents employees' perception of the costs associated with leaving the organization. It reflects a calculative attachment based on perceived economic, social, or professional losses that might result from turnover. While continuance commitment can maintain workforce stability, research highlights that overreliance on this dimension without enhancing emotional or moral bonds may lead to disengagement or minimal discretionary effort (Sharma & Yadav, 2020). Normative commitment entails an employee's sense of obligation or moral duty to remain with the organization. It is influenced by organizational culture, socialization, and ethical values. Employees high in normative commitment feel that staying with the organization is the "right" thing to do, often translating into loyalty and adherence to organizational norms (Nguyen, 2021).

In contemporary organizational settings, balancing these three dimensions is crucial. High affective and normative commitment fosters intrinsic motivation and engagement, while continuance commitment ensures stability during periods of change. For organizations such as electric cooperatives, understanding these dimensions is vital to design policies, leadership strategies, and employee development programs that enhance retention, performance, and alignment with organizational goals. Organizational commitment, therefore, serves as a central construct linking leadership practices, employee behavior, and long-term organizational sustainability.

3. Methodology

Research Design - This study employed a quantitative descriptive-correlational research design to examine the extent to which decision-making practices determine employees' emotional intelligence and organizational commitment in the Nueva Vizcaya Electric Cooperative (NUVELCO). A quantitative approach was deemed appropriate because it enables the systematic collection of structured data from a sizeable population and facilitates statistical analysis to determine trends, relationships, and predictive associations among variables (Creswell & Creswell, 2018). The descriptive component of the study was used to determine the prevailing level of decision-making practices demonstrated within the cooperative, specifically in terms of routine, adaptive, innovative, and participative decision-making. Likewise, it described employees' levels of emotional intelligence and organizational commitment, thereby establishing a comprehensive profile of the organization's administrative and behavioral dynamics. The correlational component examined the relationships between decision-making practices and the employee outcomes of emotional intelligence and organizational commitment without manipulating any study variable. This design was appropriate because the variables under investigation naturally occur within organizational settings and can be analyzed in their authentic context (Gay et al., 2012). Through this approach, the study assessed how managerial decision-making behaviors may contribute to employees' emotional competence and their psychological attachment to the organization.

Emotional intelligence, defined as the capacity to recognize, understand, regulate, and effectively utilize emotions in oneself and others (Goleman, 1998; Salovey & Mayer, 1990), is widely recognized as a critical competency in promoting workplace collaboration, resilience, and interpersonal effectiveness. Organizational commitment, on the other hand, refers to employees' psychological attachment, loyalty, and sense of obligation to remain with the organization (Meyer & Allen, 1991). Higher organizational commitment has been associated with improved job performance, greater job satisfaction, and reduced turnover intentions. By utilizing a descriptive-correlational design, this study generated empirical evidence regarding how decision-making practices influence

key employee outcomes, thereby providing a basis for enhancing leadership approaches, organizational development strategies, and employee engagement initiatives within electric cooperative settings.

Research Environment - The study was conducted at the Nueva Vizcaya Electric Cooperative, Inc. (NUVELCO), with its main office located in Barangay Gabut, Dupax del Sur, Nueva Vizcaya, including its six strategically distributed branch offices serving the northern and southern municipalities of the province. These offices collectively constitute NUVELCO's operational and administrative network, which supports power distribution, customer service, and rural electrification throughout its service coverage area. NUVELCO operates under the mission of providing reliable, efficient, quality, and reasonably priced electric service while pursuing sustainable and exemplary organizational performance. This institutional direction emphasizes operational excellence, innovation, and service responsiveness, making it an appropriate organizational setting for examining administrative decision-making and its influence on employee outcomes. The cooperative's vision of becoming a diamond-awardee electric cooperative with empowered and satisfied member-consumer-owners reflects its aspiration toward excellence in governance, service delivery, and organizational performance. This vision highlights the importance of collaborative leadership, employee empowerment, and adaptive management practices, all of which are strongly linked to effective decision-making.

NUVELCO's organizational culture is likewise anchored on its core values of nobility, unity, volunteerism, excellence, loyalty, commitment, and optimism, which shape workplace behavior, professional relationships, and organizational identity. These values provide a meaningful context for examining how managerial decision-making practices influence employees' emotional intelligence and organizational commitment. Recent modernization initiatives—including ISO 9001:2015 Quality Management System certification, automated billing systems, and advanced inventory management technologies—have introduced significant organizational changes requiring adaptive leadership, emotionally intelligent responses, and stronger employee commitment. Given these organizational developments, NUVELCO provides a suitable environment for investigating how decision-making practices shape employee behavioral and organizational outcomes.

Respondents of the Study - The respondents of the study consisted of 98 permanent employees of the Nueva Vizcaya Electric Cooperative, representing 77.16% of the organization's total workforce of 127 employees. Respondents were drawn from the main office and six branch offices to ensure representation across administrative, technical, customer service, and operational units. The sample size was determined using Slovin's Formula at a 0.05 level of significance, ensuring sufficient statistical representation of the study population.

Table 1
Distribution of Respondents by Office/Branch

Office/Branch	Number of Employees	Number of Respondents	Percentage
Main Office (Gabut)	43	32	32.65
North Area – Branch 1 (Solano, Villaverde, Quezon)	14	11	11.22
North Area – Branch 2 (Bayombong, Ambaguio)	14	11	11.22
North Area – Branch 3 (Bagabag, Diadi)	14	11	11.22
South Area – Branch 1 (Bambang, Kayapa, Kasibu)	14	11	11.22
South Area – Branch 2 (Aritao, Sta. Fe, Alfonso Castañeda)	14	11	11.22
South Area – Branch 3 (Dupax del Norte, Dupax del Sur)	14	11	11.22
Total	127	98	100.00

Sampling Procedure - The study employed a multi-stage sampling procedure using proportionate stratified random sampling. NUVELCO's main office and six branch offices were treated as distinct strata to ensure proportional representation of employees from each organizational unit. Within each stratum, respondents were selected using simple random sampling, thereby minimizing selection bias and ensuring equal participation opportunities. This sampling design enhanced representativeness and strengthened the generalizability of findings across the cooperative's organizational structure.

Research Instruments - Three standardized and validated instruments were used: **Decision-Making Practices Questionnaire** - Decision-making practices were measured using a 40-item standardized questionnaire assessing four dimensions: routine, adaptive, innovative, and participative decision-making. The instrument, previously used by Badongen (2019), demonstrated excellent reliability (Cronbach's $\alpha = .916$). **Emotional Intelligence Questionnaire** - Emotional intelligence was measured using a 50-item self-assessment questionnaire based on Goleman's Emotional Intelligence Framework, validated by the MyNavy HR Expanded Operational Stress Control Project (2023). The instrument evaluates emotional self-awareness, self-regulation, motivation, empathy, and social skills. **Organizational Commitment Questionnaire** - Organizational commitment was measured using the Allen and Meyer (1990) Organizational Commitment Scale, consisting of 24 items covering variables such as affective commitment, continuance commitment, and normative commitment. The instrument demonstrated strong internal consistency (Cronbach's $\alpha = .872$). All instruments used a **five-point Likert scale** with 5 = Always Excellent, 4 = Often Very Good, 3 = Sometimes Good, 2 = Seldom Fair, and 1 = Never Poor.

Data Gathering Procedure - Prior to data collection, formal approval was secured from the General Manager of NUVELCO through an official request endorsed by the Dean of the College of Arts and Sciences. Upon approval, coordination was conducted with department heads and branch managers for the administration of the research instruments. Selected respondents were oriented regarding the objectives, significance, and procedures of the study. They were informed that participation was voluntary and that confidentiality, anonymity, and data privacy would be strictly maintained. Informed consent was obtained prior to questionnaire administration. After retrieval, responses were checked for completeness, coded, tabulated, and prepared for statistical analysis. This systematic procedure ensured data accuracy, ethical compliance, and methodological rigor.

Statistical Treatment of Data - The following statistical tools were employed: **Mean**. The weighted mean was used to determine the extent of decision-making practices and the levels of emotional intelligence and organizational commitment among employees. **Pearson Product-Moment Correlation Coefficient (Pearson r)**. Pearson's r was used to determine the degree and direction of the relationship between - decision-making practices and emotional intelligence; and decision-making practices and organizational commitment. This analysis established whether statistically significant relationships existed among the variables and determined the strength of these associations.

4. Results and Discussion

The findings of the study provide substantial empirical evidence on the interconnected roles of administrative decision-making practices, employees' emotional intelligence, and organizational commitment within the Nueva Vizcaya Electric Cooperative (NUVELCO). Taken collectively, the results portray an organization characterized by strong leadership practices, emotionally competent employees, and a workforce that demonstrates a high degree of commitment to institutional goals and values. More importantly, the study establishes meaningful relationships among these variables, emphasizing that leadership behavior—particularly in decision-making—serves as a critical organizational mechanism that shapes employee attitudes, emotional competencies, and long-term commitment. These findings carry significant implications for organizational development, human resource management, and leadership effectiveness in cooperative institutions and similar organizational contexts.

The first major finding revealed that respondents perceived their administrators' decision-making practices as highly favorable, with an overall grand mean of 4.39, interpreted as Very Good. This indicates that employees generally view their administrators as competent, strategic, and responsive in carrying out managerial functions and organizational decision-making responsibilities. Among the dimensions examined, innovative decision-making emerged as the strongest area, obtaining the highest mean score of 4.62, interpreted as Excellent. This suggests that administrators possess a notable ability to think creatively, generate strategic alternatives, and develop practical solutions to organizational challenges. In a rapidly changing organizational environment—particularly in utility and service-oriented institutions such as electric cooperatives—innovation in decision-making is essential for addressing operational complexities, responding to technological advancements, and

adapting to external demands. The high rating in this area reflects administrative openness to new ideas, progressive leadership orientation, and the capacity to transform challenges into opportunities for organizational growth and efficiency.

Closely following innovative decision-making was participative decision-making, which garnered a mean of 4.54, likewise interpreted as Excellent. This finding suggests that administrators actively encourage employee involvement, consultation, and shared responsibility in organizational decisions. Participative leadership has long been recognized as a catalyst for trust-building, empowerment, and stronger organizational ownership among employees. When employees feel that their opinions are valued and that they have a voice in organizational matters, they are more likely to develop stronger engagement, higher morale, and deeper commitment to institutional objectives. The excellent rating in participative decision-making therefore reflects a healthy organizational climate characterized by collaboration, transparency, and inclusive governance. Meanwhile, routine decision-making ($M = 4.24$) and adaptive decision-making ($M = 4.18$), both interpreted as Very Good, indicate that administrators are likewise effective in handling regular operational matters and adjusting to changing circumstances, although adaptive decision-making presents some room for further enhancement. This is particularly relevant in organizations experiencing rapid organizational transitions, where adaptability, resilience, and situational responsiveness are increasingly essential leadership competencies.

The second major finding demonstrated that employees possess a high level of emotional intelligence, reflected by a grand mean of 4.42, interpreted as Very Good. This result suggests that employees generally have strong emotional awareness, self-regulation, and interpersonal functioning, all of which are important in maintaining healthy workplace relationships, managing occupational stress, and sustaining professional productivity. Among the emotional intelligence dimensions, self-motivation emerged as the strongest component, with a mean score of 4.72, interpreted as Excellent. This finding indicates that employees possess strong internal drive, perseverance, and goal orientation despite challenges and workplace demands. Highly self-motivated employees tend to exhibit resilience, sustained performance, and a proactive attitude toward organizational tasks, making them valuable contributors to institutional productivity and long-term organizational sustainability.

Likewise, self-awareness ($M = 4.55$) and mood management ($M = 4.50$), both rated Excellent, demonstrate that employees have developed strong personal emotional competencies, particularly in recognizing their emotions, understanding their emotional triggers, and regulating emotional responses effectively. These competencies are essential for maintaining professionalism, minimizing conflict, and responding constructively to stressful or emotionally demanding workplace situations. Employees with strong self-awareness and emotional regulation are generally better equipped to navigate interpersonal challenges and contribute positively to organizational culture. On the other hand, awareness of others ($M = 4.02$) and managing relations with others ($M = 4.30$), though still rated Very Good, obtained comparatively lower scores. This suggests that while employees exhibit generally healthy interpersonal functioning, there remains opportunity to further strengthen empathy, relationship-building, conflict management, and collaborative communication skills. Improving these relational dimensions could further enhance organizational cohesion, teamwork, and service delivery effectiveness.

The third major finding established that respondents possess a high level of organizational commitment, with a grand mean of 4.37, interpreted as Very Good. This indicates that employees demonstrate strong attachment to the organization, loyalty to institutional goals, and willingness to remain part of the cooperative. Among the dimensions, affective commitment ranked highest with a mean of 4.52, interpreted as Excellent, indicating that employees' commitment is primarily rooted in emotional attachment, identification, and genuine connection to the organization. This is a particularly favorable organizational indicator because affective commitment reflects intrinsic loyalty rather than obligation or practical necessity. Employees who remain because they genuinely value their organization tend to be more engaged, productive, and aligned with institutional goals.

Meanwhile, normative commitment ($M = 4.32$) and continuance commitment ($M = 4.26$), both interpreted as Very Good, further suggest that employees also feel a sense of moral responsibility to remain with the organization

while recognizing the personal and professional costs associated with leaving. The combination of strong affective, normative, and continuance commitment reflects a well-balanced commitment profile characterized by emotional loyalty, ethical obligation, and practical organizational attachment. Such a commitment structure contributes significantly to organizational stability, reduced turnover intentions, and sustained workforce engagement—critical elements for long-term institutional success.

The fourth major finding revealed a moderate positive relationship between administrators' decision-making practices and employees' emotional intelligence ($r = 0.572$), with the relationship being statistically significant at $p = 0.001$. This indicates that more effective, inclusive, adaptive, and innovative leadership decision-making is associated with higher levels of emotional competence among employees. Leadership practices significantly shape organizational climate, communication patterns, and employee psychological experiences. Administrators who make thoughtful, fair, and participative decisions create workplace environments characterized by trust, openness, and psychological safety—conditions that naturally foster emotional awareness, empathy, and interpersonal effectiveness among employees. The coefficient of determination ($r^2 = 32.72\%$) further indicates that decision-making practices explain a substantial proportion of variation in employees' emotional intelligence. This finding highlights leadership not merely as an operational function but as a formative influence on employees' emotional development and workplace behavior.

The fifth major finding showed a strong positive relationship between administrators' decision-making practices and employees' organizational commitment ($r = 0.604$), which was likewise statistically significant at $p = 0.001$. This indicates that effective leadership decision-making substantially contributes to stronger employee loyalty, institutional attachment, and retention intentions. When administrators demonstrate fairness, transparency, responsiveness, and inclusivity in decision-making, employees are more likely to perceive organizational leadership positively, trust management processes, and develop stronger identification with organizational values. The coefficient of determination ($r^2 = 36.48\%$) suggests that decision-making practices explain a significant proportion of employees' commitment levels, further underscoring the central role of leadership behavior in shaping organizational attachment. This finding reinforces the principle that organizational commitment is not developed solely through compensation or structural incentives, but significantly through employees' perceptions of leadership quality and managerial competence.

The sixth finding further revealed a moderate positive relationship between emotional intelligence and organizational commitment ($r = 0.592$), with statistical significance at $p = 0.001$. This indicates that employees who possess stronger emotional intelligence are more likely to exhibit greater commitment to their organization. Emotionally intelligent employees are generally better able to manage workplace stress, build meaningful professional relationships, navigate interpersonal challenges, and maintain positive organizational attitudes—all of which strengthen attachment to the institution. The coefficient of determination ($r^2 = 35.05\%$) indicates that emotional intelligence explains a substantial portion of organizational commitment. This finding emphasizes that employee commitment is not solely an organizational outcome influenced by leadership, but is also shaped by employees' internal emotional competencies, resilience, and relational effectiveness.

Finally, the development of an organizational intervention program grounded on benchmark statements with the lowest mean ratings demonstrates the practical significance of the study. By identifying the weakest indicators within decision-making practices, emotional intelligence, and organizational commitment, the researcher was able to develop an evidence-based, targeted, and responsive capacity-building framework. The proposed intervention includes four training modules for administrators focusing on strengthening decision-making competencies, and eight developmental modules for employees aimed at improving emotional intelligence and organizational commitment. This strategic design ensures alignment between empirical findings and organizational development initiatives, making the intervention highly relevant, needs-based, and actionable. More importantly, it transforms research findings into practical organizational solutions capable of enhancing leadership effectiveness, employee well-being, and institutional performance. Collectively, the study affirms that strong leadership practices, emotionally intelligent employees, and organizational commitment form an interconnected foundation for

5. Conclusions

Based on the significant findings of the study, the following conclusions were derived.

- The administrators of NUVELCO generally demonstrated very good decision-making practices, indicating effective leadership in routine, adaptive, innovative, and participative dimensions.
- The respondents demonstrated a very good level of emotional intelligence, indicating that they generally possess strong abilities in understanding, regulating, and utilizing their emotions effectively in both personal and work-related contexts.
- The respondents demonstrated a very good level of organizational commitment, indicating that they exhibit a strong sense of loyalty, attachment, and responsibility toward their organization.
- There is a moderate positive relationship between administrators' decision-making practices and employees' emotional intelligence.
- There is a strong positive relationship between administrators' decision-making practices and employees' organizational commitment.
- There is a moderate positive relationship between employees' emotional intelligence and their organizational commitment.
- A training design was crafted based on the significant findings of the study for each of the administrators and employees of NUVELCO.

Recommendations - Based on the significant findings of the study and the conclusions derived, the following recommendations were offered.

- Since administrators were found to demonstrate very good decision-making across all dimensions, it is recommended that NUVELCO sustain these strengths through continuous leadership development initiatives that reinforce consistency in routine, adaptive, innovative, and participative decision-making practices, ensuring their continued effectiveness in organizational operations.
- Given the very good level of emotional intelligence among respondents, NUVELCO may implement sustained emotional intelligence development programs aimed at further enhancing employees' capacity for emotional regulation, self-awareness, empathy, and effective interpersonal functioning in the workplace.
- In view of the very good level of organizational commitment, management may continue strengthening institutional strategies that foster employee loyalty, engagement, and sense of belonging through consistent recognition systems, career development opportunities, and supportive organizational policies.
- Since a moderate positive relationship exists between decision-making practices and emotional intelligence, administrators are encouraged to adopt and model emotionally supportive leadership behaviors that actively promote the development of employees' emotional competence within the organization.
- In light of the strong positive relationship between decision-making practices and organizational commitment, NUVELCO may further enhance leadership strategies that emphasize participation, fairness, transparency, and inclusiveness to strengthen employees' attachment and loyalty to the organization.

- Given the moderate positive relationship between emotional intelligence and organizational commitment, development interventions may be designed to integrate emotional skills enhancement with strategies that reinforce employees' sense of responsibility, engagement, and identification with the organization.
- The developed training interventions may be fully implemented, continuously monitored, and systematically evaluated to ensure that existing strengths are maintained while identified areas for improvement are effectively addressed for sustained organizational growth.
- Future researchers are encouraged to replicate this study using a mixed-methods research design and incorporate additional variables to gain a more comprehensive understanding of the interplay among decision-making practices, emotional intelligence, and organizational commitment in NUVELCO and similar organizations.

6. References

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Organization development practices and human resource management of the Nueva Vizcaya Electric Cooperative (NUVELCO): Their relationship with organizational integrity

Carub, Juliet G.

Nueva Vizcaya State University, Philippines

Ocampo, Imelda S. ✉

Nueva Vizcaya State University, Philippines

Agustin, Arnel A.

Nueva Vizcaya State University, Philippines (draaagustin777@yahoo.com)



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Abstract

This study examined the organization development (OD) practices and human resource management (HRM) systems of Nueva Vizcaya Electric Cooperative and their relationship with organizational integrity. Specifically, it assessed the extent of implementation of OD practices across the dimensions of personnel, structure, strategy, change management, technology, empowerment, work ethics, goal setting, products and services, and quality of work life; evaluated HRM practices in terms of staffing, performance appraisal, career development, incentives and rewards, human resource development, compensation and benefits, and employee-management relations; and determined their correlation with organizational integrity, particularly in ethical leadership, transparency and accountability, compliance with laws and regulations, and community engagement. Employing a descriptive-correlational research design, data were collected from regular and permanent employees selected through multi-stage sampling using stratified and simple random sampling techniques. A validated and reliable survey instrument was utilized, and data were analyzed using weighted mean and Pearson product-moment correlation at a 0.05 level of significance. Findings revealed that NUVELCO's OD practices ($M = 4.49$), HRM practices ($M = 4.42$), and organizational integrity ($M = 3.60$) were all rated Very Good, indicating strong organizational systems and generally favorable ethical standards. Correlation analysis further showed significant positive relationships between OD practices and organizational integrity ($r = 0.628$), HRM practices and organizational integrity ($r = 0.712$), and OD practices and HRM ($r = 0.694$), suggesting that strengthened organizational systems contribute substantially to ethical behavior, transparency, accountability, and organizational credibility. Based on these findings, a holistic OD intervention framework was developed to strategically align OD and HRM practices toward reinforcing organizational integrity, improving workforce engagement, and sustaining long-term organizational effectiveness.

Keywords: human resource management, organization development practices, organizational integrity

Organization development practices and human resource management of the Nueva Vizcaya Electric Cooperative (NUVELCO): Their relationship with organizational integrity

1. Introduction

The 21st century has placed new demands on organizations: rapid technological change, heightened stakeholder expectations, and increasingly stringent regulatory and ethical standards require firms to be both adaptive and morally coherent. Organization development (OD) practices—strategic interventions designed to align structure, processes, and people—must therefore operate hand-in-hand with contemporary human resource management (HRM) strategies to sustain performance, trust, and legitimacy. When OD initiatives and HRM reinforce one another, they create a resilient organizational architecture capable of delivering reliable services while safeguarding core values. Conversely, fragmented OD or weak HRM practices can leave organizations vulnerable to ethical lapses, poor morale, and reputational harm.

For service utilities such as electric cooperatives—whose mandate blends technical delivery with public accountability—the coupling of developmental practices and people management is especially consequential. Electric cooperatives operate at the intersection of public expectation and operational complexity: they must maintain reliable energy distribution while also demonstrating transparency, fairness, and stewardship of stakeholder resources. Organizational integrity—understood as the consistent enactment of moral and legal norms across policy, process, and behavior—becomes a vital lens through which cooperative sustainability is judged. This study therefore investigates how organization development practices together with HRM shape organizational integrity within the Nueva Vizcaya Electric Cooperative, offering evidence-based insight for practitioners and policy makers in similar public-service settings.

Recent scholarship conceptualizes organizational integrity as a multidimensional construct that links stated commitments to institutionalized processes and enacted behavior; measurement models have been proposed to help organizations assess integrity systematically (Fuerst et al., 2023). Understanding integrity as a triad—commitments, institutionalization, implementation—helps situate OD and HRM as both prerequisites and mechanisms for ethical organizational performance. Human resource practices that integrate social responsibility and ethical signals—often called socially responsible HRM (SRHRM)—have been shown to promote employee moral voice and pro-social behavior, largely by satisfying basic psychological needs and fostering autonomous motivation (Zhao, Chen, & Liu, 2022). Such HRM approaches can therefore be instrumental in translating organizational commitments into employee actions that preserve integrity.

Empirical reviews of modern HRM and OD point to consistent positive links between HRM practices (training, career development, performance systems) and organizational outcomes including performance, commitment, and ethical culture; contemporary studies emphasize that HRM must be intentionally designed to support developmental goals and ethical leadership if integrity is to follow (Arokiasamy et al., 2024; Hosen et al., 2024). This research highlights the mediating role of leadership and perceived organizational justice in the HRM–integrity relationship: ethical leadership and fair HR processes strengthen employees’ perceptions of justice and enhance integrity-consistent behavior (Grobler & Grobler, 2024). For a public cooperative like Nueva Vizcaya Electric Cooperative, combining OD interventions, SRHRM practices, and ethical leadership offers a pragmatic pathway to institutionalize integrity while improving service delivery and public trust.

Although the literature on organization development (OD), human resource management (HRM), and organizational integrity has grown, several gaps remain that justify the conduct of this study. First, existing frameworks on organizational integrity emphasize its multidimensional nature—linking commitments, institutionalization, and implementation—but empirical applications are still limited, especially within public

utilities and community-based cooperatives (Fuerst et al., 2023). Much of the current evidence comes from private or corporate settings, leaving a gap in understanding how integrity develops in organizations that operate under cooperative principles, public accountability, and community ownership.

Similarly, while studies demonstrate that HRM practices can cultivate ethical behavior and moral voice among employees (Zhao et al., 2022), there is little examination of how these practices interact with OD interventions in non-profit or semi-government service institutions, such as electric cooperatives. Most HRM–integrity research focuses on commercial organizations, despite the fact that service utilities face unique challenges—such as resource constraints, political pressures, and high public scrutiny—that may influence how integrity is strengthened or compromised. Another gap concerns the need for localized, context-specific research in developing countries. Scholars have noted that HRM models and OD frameworks developed in Western contexts may not fully capture how organizations in Asia operationalize integrity, manage employees, or implement developmental change (Arokiasamy et al., 2024). Electric cooperatives in the Philippines, in particular, operate within a hybrid governance structure involving member-consumers, government regulators, and local stakeholders—yet empirical studies linking OD, HRM, and integrity in this environment remain scarce.

Leadership and organizational justice have also emerged as critical mediators in ensuring ethical organizational behavior (Grobler & Grobler, 2024). However, the combined influence of OD strategies, HRM systems, and justice perceptions on integrity has not been systematically explored. This leaves a conceptual and empirical gap on how these elements jointly reinforce or weaken organizational integrity. Given these gaps, the present study focuses on the Nueva Vizcaya Electric Cooperative to generate evidence on how OD practices and HRM collectively relate to organizational integrity within a public service context. This contributes not only to theoretical advancement but also to practical insights that can strengthen governance and accountability in electric cooperatives.

This study is strongly aligned with global, national, and institutional research priorities, beginning with the Sustainable Development Goals (SDGs). Specifically, it advances SDG 16: Peace, Justice, and Strong Institutions, which calls for the promotion of effective, accountable, and transparent institutions. By examining organizational development practices, human resource management, and organizational integrity, the study directly supports efforts to strengthen governance mechanisms within public service institutions such as electric cooperatives. Integrity in organizational processes reflects not only ethical leadership but also fair and efficient service delivery—key indicators in achieving SDG 16. Additionally, the study complements SDG 8: Decent Work and Economic Growth, as effective HRM contributes to improved employee well-being, productivity, and sustainable organizational operations.

At the national level, the study aligns with the National Higher Education Research Agenda (NHERA), which prioritizes research on governance, institutional performance, human development, and organizational capacity-building. NHERA emphasizes the significance of evidence-based management practices to strengthen public institutions and improve service delivery. This research supports that directive by generating empirical insights on how OD and HRM practices influence organizational integrity in a utility sector vital to local socioeconomic development. The study is also anchored in the Nueva Vizcaya State University (NVSU) Research Agenda, particularly under the themes of *Good Governance*, *Public Service Innovation*, and *Socioeconomic Development*. NVSU encourages research that uplifts local institutions and enhances community welfare. By focusing on an essential service provider—Nueva Vizcaya Electric Cooperative—the study contributes to improving governance structures, strengthening transparency, and elevating public trust. The findings may serve as a basis for policy recommendations and capacity-building initiatives both within NVEC and other cooperatives in the region.

Lastly, the research reflects the priorities of the College of Arts and Sciences (CAS) Research Agenda, which include organizational studies, ethical governance, leadership development, and community-engaged research. The interdisciplinary nature of the study—integrating organizational behavior, human resource management, ethics, and public administration—makes it directly relevant to the CAS thrust of promoting socially responsive

and contextually grounded research. Through its focus on organizational integrity, the study aligns with CAS's commitment to advancing ethical leadership and institutional accountability within local organizations.

It has been the observation of the researcher that employees of the Nueva Vizcaya Electric Cooperative (NUVELCO) operate within a complex service environment characterized by growing consumer expectations, increasing regulatory demands, and continuous organizational changes. These conditions have surfaced several concerns and challenges that directly affect employee performance, workplace relationships, and the overall integrity of the organization. One of the prevailing concerns is the inconsistency in organizational development practices, particularly in areas such as communication flow, change implementation, and strategic alignment. Employees report variations in how policies are executed across departments, creating uncertainty and confusion that hinder both efficiency and accountability.

Human resource management processes also present notable challenges. Issues related to performance appraisal, limited training opportunities, unclear career progression, and perceived inequities in workload distribution have been observed. Such inconsistencies affect employee morale and may weaken trust in management decisions. Additionally, the cooperative structure of NUVELCO—defined by shared ownership and public accountability—requires transparent and ethical practices, yet employees have raised concerns about lapses in communication, delayed resolutions of internal issues, and insufficient engagement in decision-making processes. These elements contribute to difficulties in sustaining organizational integrity, especially when frontline employees feel inadequately supported or disconnected from institutional goals.

External pressures intensify these challenges. NUVELCO employees often face demanding situations such as complaints from member-consumers, urgent service restoration during power interruptions, and the need to comply with evolving national energy policies. High-stress operational conditions may expose weaknesses in teamwork, coordination, and leadership responsiveness. These concerns collectively highlight the need to investigate how organizational development practices and human resource management influence the integrity of the cooperative.

The study assumes that employees are capable of providing honest and accurate responses regarding organizational development practices, HRM systems, and integrity-related behaviors within NUVELCO. It presumes that organizational development and HRM significantly influence institutional integrity and that these relationships can be measured through validated research instruments. It further assumes that employees across departments share comparable experiences with organizational systems, even though the degree of exposure to management processes may differ. Lastly, the study assumes that strengthening OD and HRM will result in improved integrity, employee satisfaction, and more ethical and accountable service delivery within the cooperative. Hence, this study.

2. Related Literature

The study on the organization development practices and human resource management of the Nueva Vizcaya Electric Cooperative (NUVELCO) and their relationship with organizational integrity is anchored on a combination of established management theories that provide a robust conceptual lens. Organization development practices (ODP) are grounded in Lewin's Change Theory (1947) and complemented by Systems Theory, which together conceptualize the organization as a dynamic, interrelated system undergoing planned interventions. Lewin's model—comprising unfreezing, change, and refreezing—provides a framework to understand how strategic interventions in people, processes, and structures can produce sustainable organizational transformation. Contemporary studies emphasize that change-oriented interventions enhance employees' readiness to adapt and improve overall organizational effectiveness (Metwally, Ruiz-Palomino, Metwally, & Gartzia, 2019). Systems Theory further underscores that modifications in one component, such as strategy or technology, reverberate across the organizational system, influencing both individual and collective outcomes.

Human resource management (HRM), as the second variable, is theoretically anchored in the Resource-Based View (RBV) Theory by Barney (1991). HRM systems, including staffing, performance appraisal, career

development, compensation, and employee relations, are viewed as strategic resources that can produce sustainable competitive advantage if effectively developed and deployed. Recent research demonstrates that HRM practices that invest in employee capabilities and satisfaction contribute to higher commitment, ethical behavior, and organizational performance (Zheng et al., 2022; Aktar & Pangil, 2018). Additionally, motivational frameworks, such as Herzberg's Two-Factor Theory, complement RBV by explaining how well-designed HRM practices enhance engagement and work-related satisfaction, supporting employees as both productive and morally committed members of the organization.

Organizational integrity, the third variable, is anchored in Ethical Leadership Theory and Stakeholder Theory. Ethical Leadership Theory posits that leaders who model moral behavior and prioritize transparency and accountability influence employee behavior and organizational culture (Guo, 2022). Stakeholder Theory emphasizes the responsibility of organizations to multiple constituencies, including employees, members, regulators, and the community, which reinforces the need for integrity-based practices in decision-making, policy implementation, and service delivery (Zheng et al., 2022). Organizational integrity thus emerges from the interplay of ethical leadership, stakeholder engagement, and systemically reinforced OD and HRM practices.

Conceptually, the study posits that OD practices and HRM interventions act as critical inputs in shaping organizational capabilities and human capital. When guided by ethical leadership and stakeholder accountability, these inputs influence the cultivation and maintenance of organizational integrity. OD practices provide the structural and cultural interventions necessary for transformation, HRM ensures the development and motivation of employees as strategic resources, and ethical leadership ensures that both processes align with moral and societal expectations. Together, these theoretical anchors provide a coherent framework for examining how organizational development and human resource practices influence ethical and accountable organizational behavior in a public cooperative setting.

Organization development (OD) practices represent intentional, systematic interventions aimed at improving an organization's effectiveness, adaptability, and health. At their core, these practices emphasize not only structural change but also human capacity building, engagement, and sustainable performance. According to recent literature, OD is increasingly framed as a bundle of practices that address multiple dimensions — from empowerment and technology to work-life quality and ethical behavior — which are critical to ensuring that change is not just implemented but internalized by employees (Organization Development Journal, 2025). One essential dimension of OD is people — how employees are developed, engaged, and empowered. Modern OD emphasizes investing in human capital, building trust, and enabling individuals to contribute strategically rather than merely carrying out transactional tasks (Journal of Informatics Education & Research, 2024). Another dimension is structure and strategy, which refers to aligning organizational architecture — roles, reporting lines, and strategy — with long-term development ambitions. As organizations contend with increasingly rapid change, OD must ensure that structural redesign supports both innovation and stability.

Change management is another critical field of OD: interventions such as diagnosing cultural resistance, facilitating unfreezing of old patterns, and reinforcing new norms are central to lasting transformation. This dimension often intersects with technology, since digitalization and new ways of working require social adoption as well as technical deployment. Literature on “new ways of working” highlights how technological practices (e.g., flexible work, digital tools) must be complemented by people-oriented change efforts to realize both performance and well-being benefits. Another important dimension is empowerment, which involves giving employees greater autonomy, participation in decision-making, and ownership over their work. Empowerment supports OD because it helps build a culture of trust and continuous improvement, rather than top-down change. Linked to that is work ethics and goal setting, where ethical norms, performance expectations, and shared objectives are embedded into OD interventions to cultivate both efficacy and moral alignment.

Quality of work life (QWL) stands out prominently in contemporary OD frameworks. Research shows that improving QWL — such as work-life balance, job satisfaction, and the work environment — not only sustains

engagement, but also contributes to higher productivity and organizational commitment (Leitão, Pereira, & Gonçalves, 2019). Moreover, a study conducted in educational settings found that QWL is significantly associated with employee engagement, suggesting that OD must explicitly target the work-life dimension to foster long-term human and organizational flourishing (Acta Colombiana de Psicología, 2020). It is noted by the researcher that organization development practices today are multidimensional: they address structural alignment, human empowerment, technological change, ethical goal setting, and quality of work life. Scholars increasingly agree that sustainable and meaningful OD requires not just superficial interventions but a holistic, human-centered approach — one that integrates the technical and the social, the individual and the institutional.

On the other hand, human resource management (HRM) as a variable encompasses a set of strategic practices aimed at managing the workforce to achieve organizational objectives while promoting employee growth, motivation, and satisfaction. HRM has evolved beyond administrative functions to a comprehensive approach that aligns human capital with organizational goals, fostering performance and engagement (Van de Voorde, Paauwe, & Van Veldhoven, 2022). In contemporary organizations, HRM is operationalized across multiple dimensions, each contributing to employee effectiveness and organizational success. The staffing process refers to the systematic recruitment, selection, and placement of employees. Effective staffing ensures that individuals possess the right skills, attitudes, and potential to meet organizational needs. Research has shown that structured and merit-based staffing processes enhance job performance, organizational commitment, and employee satisfaction (MDPI, 2023).

Performance appraisal is a key HRM practice designed to evaluate employee contributions, provide constructive feedback, and identify development needs. Contemporary appraisal systems emphasize continuous feedback and alignment with organizational objectives, which improves accountability, motivation, and professional growth (Shiferaw, 2022). Career development focuses on offering pathways for professional growth through promotions, skill enhancement, and succession planning. Organizations that invest in career development foster employee engagement, loyalty, and retention, as individuals perceive opportunities for long-term progression (Van de Voorde et al., 2022). Incentives and awards constitute formal recognition for performance and contributions. Well-designed reward systems, including bonuses, merit pay, and recognition programs, are positively correlated with motivation, job satisfaction, and organizational commitment (Hina & Siraj, 2025).

Human resource development (HRD) involves training, coaching, and learning initiatives that build competencies and improve performance. HRD is integral to organizational adaptability and resilience, particularly in dynamic and technology-driven environments (Bohlouli et al., 2020). Compensation and benefits include monetary and non-monetary rewards provided to employees. Equitable and competitive compensation enhances retention, satisfaction, and engagement, signaling that the organization values its workforce (MDPI, 2023). Finally, employee-management relations refer to the interactions, communication, and collaboration between employees and supervisors. Positive relations foster trust, reduce conflicts, and promote a cooperative organizational culture, which supports overall performance and organizational integrity (Van de Voorde et al., 2022).

It is also noted by the researcher that HRM practices across these dimensions work synergistically to develop competent, motivated, and committed employees. When effectively implemented, they not only enhance individual performance but also strengthen organizational capability, culture, and long-term sustainability. Furthermore, organizational integrity refers to the consistent alignment between an organization's values, principles, and actions, ensuring ethical behavior, compliance, and trustworthiness across all levels. It is a critical determinant of sustainable performance, reputation, and stakeholder confidence. In contemporary research, organizational integrity is viewed not merely as an ethical requirement but as a strategic resource that fosters employee commitment, stakeholder trust, and long-term organizational resilience (Guo, 2022).

Ethical leadership forms the foundation of organizational integrity. Leaders who demonstrate honesty, fairness, and moral decision-making influence the behavior of employees, create a culture of ethical accountability, and encourage ethical conduct in daily operations (Metwally, Ruiz-Palomino, Metwally, & Gartzia, 2019). Studies

indicate that ethical leadership enhances employees' ethical awareness, reduces unethical practices, and strengthens overall organizational performance. Transparency and accountability are closely intertwined dimensions that reinforce integrity. Transparency involves the clear, open communication of decisions, policies, and performance outcomes, while accountability ensures that individuals and units are held responsible for their actions. Research shows that organizations practicing transparency and accountability experience higher levels of employee trust, engagement, and compliance with organizational goals (Sharif et al., 2020). These practices also mitigate risks associated with corruption and mismanagement.

Compliance with laws and regulations is another essential aspect of integrity. Organizations must ensure that their operations adhere to legal standards, regulatory requirements, and ethical norms. Effective compliance mechanisms, such as internal audits, risk management systems, and legal training programs, not only prevent legal violations but also enhance organizational legitimacy and stakeholder confidence (Zheng et al., 2022). Finally, community engagement and trust-building extend organizational integrity beyond internal operations to external stakeholders. Active participation in social initiatives, environmental sustainability, and community development fosters public trust and enhances the organization's social license to operate. Studies emphasize that organizations committed to meaningful engagement with communities build stronger reputations, stakeholder loyalty, and cooperative relationships, which are crucial for long-term success (Frontiers in Psychology, 2022).

Organizational integrity is multidimensional, encompassing ethical leadership, transparency and accountability, legal compliance, and community engagement. Together, these dimensions create a culture of trust, responsibility, and moral consistency that underpins sustainable organizational performance and strengthens stakeholder relationships. By embedding integrity into policies, practices, and leadership behaviors, organizations can navigate complex social and regulatory environments while maintaining ethical and operational excellence. The current study operates under the fundamental assumption that organization development practices (ODP), human resource management (HRM), and organizational integrity are interrelated constructs that collectively shape organizational performance, sustainability, and ethical culture. Organization development practices, which encompass systematic interventions in areas such as people, structure, strategy, technology, change management, and work culture, are designed to enhance organizational effectiveness, adaptability, and resilience in dynamic environments. It is assumed that when OD practices are strategically implemented, they provide a solid foundation for human resource management by aligning employee roles, competencies, and responsibilities with organizational goals, thereby facilitating seamless execution of strategies and fostering an adaptable workforce (Metwally, Ruiz-Palomino, Metwally, & Gartzia, 2019).

In a complementary manner, human resource management practices—including staffing, training, performance appraisal, career development, compensation and benefits, incentives and awards, and employee-management relations—are presumed to reinforce OD initiatives by ensuring that employees possess the requisite skills, motivation, and commitment to respond positively to organizational changes. Effective HRM practices also promote employee engagement, loyalty, and professional growth, which are critical for sustaining organizational transformation and achieving strategic objectives (Van de Voorde, Paauwe, & Van Veldhoven, 2022). Organizational integrity, reflected in ethical leadership, transparency, accountability, compliance with laws and regulations, and community engagement, is assumed to be strongly influenced by both OD and HRM practices. Structured OD interventions coupled with ethically grounded HRM systems are expected to cultivate a culture where employees consistently act in accordance with organizational values, demonstrating honesty, responsibility, and social accountability. Therefore, the study assumes positive correlations among these three variables, suggesting that enhancements in OD and HRM practices are likely to result in higher levels of organizational integrity, thereby promoting trust, credibility, and sustainable organizational performance (Guo, 2022; Zheng et al., 2022).

3. Methodology

Research Design - This study employed a quantitative research design using a descriptive-correlational

approach to examine the relationships among organizational development (OD) practices, human resource management (HRM) practices, and organizational integrity within the Nueva Vizcaya Electric Cooperative (NUVELCO). A quantitative approach was deemed most appropriate because it facilitates the systematic collection and statistical analysis of numerical data from a substantial population, enabling the identification of patterns, trends, and relationships among variables (Creswell & Creswell, 2018).

The descriptive component of the study provided a comprehensive profile of the existing organizational systems within NUVELCO. Specifically, it described the extent of implementation of OD practices such as leadership support, communication systems, knowledge sharing, employee empowerment, change management, goal setting, technology utilization, and quality of work life. It also examined HRM functions, including recruitment and selection, training and development, performance appraisal, compensation and benefits, career advancement, incentive systems, and employee relations. In addition, the study assessed the level of organizational integrity, focusing on ethical leadership, transparency, accountability, compliance with policies and regulations, and community engagement. These descriptions were essential in establishing a clear understanding of the organization's internal environment and operational dynamics.

The correlational component of the study determined whether significant relationships existed among OD practices, HRM practices, and organizational integrity. This design was particularly suitable for natural organizational settings where variables cannot be manipulated but are observed as they occur (Gay et al., 2012). Through correlational analysis, the study assessed the degree to which OD and HRM practices influenced or were associated with organizational integrity outcomes, thereby providing empirical evidence on how managerial systems contribute to ethical governance and organizational effectiveness. Organizational integrity, defined as the consistent alignment between organizational values, ethical behavior, transparency, fairness, and accountability, is a critical determinant of trust, legitimacy, and institutional sustainability. In service-oriented institutions such as electric cooperatives, integrity is essential for maintaining stakeholder confidence and ensuring effective service delivery. By quantitatively examining these variables, the study generated evidence-based insights that may enhance organizational governance, strengthen HR systems, and improve overall institutional performance.

The selected research design aligns with the objectives of the study, as it allows for both descriptive mapping and inferential analysis of key organizational constructs (Leedy & Ormrod, 2021). Ultimately, the findings contribute to the growing body of literature on organizational development, human resource management, and organizational ethics, while offering practical implications for improving leadership practices and institutional integrity within electric cooperatives.

Research Environment - The study was conducted at the Nueva Vizcaya Electric Cooperative, Inc. (NUVELCO), located at its main office in Barangay Gabut, Dupax del Sur, Nueva Vizcaya, including six strategically located branch offices across the province. These offices collectively form the cooperative's operational and administrative network responsible for power distribution, customer service, and rural electrification. NUVELCO operates under the mission of providing reliable, efficient, quality, and reasonably priced electric service, serving as a guiding framework for evaluating organizational development and HRM practices. Its vision of becoming a diamond-awardee electric cooperative with empowered and satisfied member-consumer-owners underscores its commitment to excellence, innovation, and stakeholder satisfaction. These institutional goals emphasize the importance of effective organizational systems, ethical leadership, and employee engagement.

The cooperative's organizational culture is anchored on the core values of nobility, unity, volunteerism, excellence, loyalty, commitment, and optimism, which shape workplace behavior, leadership practices, and employee interactions. These values provide a strong foundation for examining how organizational systems influence employee behavior and institutional integrity. Under the leadership of General Manager Fredel L. Salvador, PhD (appointed in 2023), NUVELCO has undergone significant modernization initiatives, including ISO 9001:2015 certification, automated billing systems, and advanced inventory management systems. These

reforms have introduced organizational changes requiring adaptive leadership, strengthened HR systems, and increased emphasis on ethical governance and employee competence. With its coverage of 15 municipalities, multiple substations, and an expanding consumer base, NUVELCO presents a complex organizational environment where leadership practices and HR systems directly influence employee behavior and organizational outcomes. Conducting the study across both main and branch offices provided a comprehensive and holistic understanding of the cooperative's structure, culture, and operational processes.

Respondents of the Study - The respondents of the study consisted of 98 permanent employees of NUVELCO, representing 77.16% of the total population of 127 employees. These respondents were drawn from the main office and six branch offices located in the northern and southern areas of Nueva Vizcaya. The sample size was determined using Slovin's formula at a 0.05 level of significance, ensuring statistical adequacy and representativeness.

Table 1
Frequency and Percentage Distribution of Respondents by Office/Branch

Office/Branch	Total Employees	Respondents	Percentage
Main Office (Gabut)	43	32	32.65
North Area – Branch 1 (Solano, Villaverde, Quezon)	14	11	11.22
North Area – Branch 2 (Bayombong, Ambaguio)	14	11	11.22
North Area – Branch 3 (Bagabag, Diadi)	14	11	11.22
South Area – Branch 1 (Bambang, Kayapa, Kasibu)	14	11	11.22
South Area – Branch 2 (Aritao, Sta. Fe, Alfonso Castañeda)	14	11	11.22
South Area – Branch 3 (Dupax del Norte and Dupax del Sur)	14	11	11.22
Total	127	98	100.00

Sampling Procedure - The study employed a multi-stage stratified random sampling technique. The main office and six branch offices of NUVELCO served as distinct strata to ensure proportional representation of employees across all organizational units. Within each stratum, simple random sampling was used to select respondents, ensuring equal opportunity for participation and minimizing sampling bias. Ethical considerations were strictly observed throughout the research process. Participation was entirely voluntary, and informed consent was obtained after respondents were fully informed of the study's objectives, procedures, and significance. Confidentiality and anonymity were strictly maintained, and no identifying information was disclosed. Data collected were used solely for academic purposes and securely stored. Respondents were also informed of their right to withdraw from the study at any time without penalty, ensuring respect for autonomy and ethical research conduct.

Research Instruments

Organizational Development Practices Questionnaire - The study utilized a 60-item standardized questionnaire developed by Seligson (2000) and validated by Badongen (2021), with a reliability coefficient of 0.917, indicating high internal consistency. The instrument measures ten dimensions: people, structure, strategy, change management, technology, empowerment, work ethics, goal setting, products and services, and quality of work life. Responses were measured using a five-point Likert scale ranging from 5 (Always) to 1 (Never). The interpretation scale is as follows: 4.50–5.00 = Excellent OD Practices, 3.50–4.49 = Very Good OD Practices, 2.50–3.49 = Good OD Practices, 1.50–2.49 = Poor OD Practices, and 1.00–1.49 = Very Poor OD Practices.

Human Resource Management Practices Questionnaire - The HRM instrument is a 35-item checklist validated by Castriciones and Vadil (2021), with a Cronbach's alpha of 0.917, indicating strong reliability. It covers recruitment, compensation, training, performance appraisal, career development, incentives, and employee relations. It uses a five-point Likert scale: 5 = Always, 4 = Often, 3 = Sometimes, 2 = Seldom, and 1 = Never with interpretation: 4.21–5.00 = Outstanding, 3.50–4.49 = Very Satisfactory, 2.50–3.49 = Satisfactory, 1.50–2.49 = Poor,

and 1.00–1.49 = Very Poor. **Organizational Integrity Questionnaire** - Organizational integrity was measured using a 24-item validated instrument developed by Castriciones et al. (2024), with a reliability coefficient of 0.827. It assesses ethical leadership, transparency, accountability, compliance, and community engagement. Responses were measured using a four-point Likert scale: 4 = Always, 3 = Often, 2 = Sometimes, and 1 = Seldom; with Interpretation 3.50–4.00 = Very Good, 2.50–3.49 = Good, 1.50–2.49 = Fair, and 1.00–1.49 = Poor.

Data Gathering Procedure - The researcher secured formal permission from the NUVELCO General Manager through an endorsed communication from the Dean of the College of Arts and Sciences. Upon approval, coordination with department heads across all offices was conducted to facilitate data collection. Respondents were oriented regarding the purpose, significance, and procedures of the study. Participation was voluntary, and confidentiality and anonymity were strictly ensured. After administering the questionnaires, responses were collected, checked for completeness, coded, and tabulated for analysis. The data were then statistically analyzed to determine relationships among OD practices, HRM practices, and organizational integrity. This structured process ensured data validity, reliability, and suitability for inferential analysis.

Statistical Treatment of Data - Data were analyzed using appropriate statistical tools: **Mean**. The weighted mean was used to determine the levels of organizational development practices, HRM practices, and organizational integrity. **Pearson Product-Moment Correlation Coefficient (Pearson r)**. Pearson r was used to determine the relationships among OD practices, HRM practices, and organizational integrity, including the direction and strength of associations among variables.

4. Results and Discussion

The comprehensive evaluation of Organization Development (OD) practices within the Nueva Vizcaya Electric Cooperative (NUVELCO) revealed an overall grand mean of 4.49, interpreted as Very Good, indicating that the cooperative demonstrates a generally strong, systematic, and well-functioning organizational development framework. This result suggests that NUVELCO has successfully institutionalized key OD mechanisms that support operational efficiency, organizational learning, and strategic alignment. The findings further indicate that while the organization has achieved a high level of maturity in OD implementation, there remain strategic areas that require refinement and enhancement to achieve excellence in all dimensions. Specifically, the dimensions of Technology, Strategy, Products and Services, Work Ethics, Structure, and Goal Setting were all rated as Excellent, signifying that NUVELCO has established strong foundations in innovation adoption, strategic direction, service delivery, ethical compliance, organizational structuring, and performance alignment. These strengths reflect a progressive organizational environment that is capable of responding to technological advancements, market demands, and institutional goals with clarity and effectiveness.

In particular, the excellent rating in technology indicates that NUVELCO has successfully integrated modern systems and tools that enhance operational efficiency, data management, and service delivery. Likewise, the high rating in strategy suggests that the organization demonstrates clear planning mechanisms and goal-oriented leadership practices that guide institutional direction. The excellence in products and services reflects strong service quality and responsiveness to consumer needs, while work ethics highlights a deeply embedded culture of professionalism, accountability, and integrity among employees. Furthermore, the strong performance in organizational structure indicates clarity in roles, responsibilities, and workflow systems, which contributes to operational stability and coordination. The excellence in goal setting demonstrates that NUVELCO maintains well-defined performance targets that align with its institutional mission and vision.

Despite these strengths, certain dimensions such as Change Management, People, Quality of Work Life, and Empowerment received ratings of Very Good, indicating areas that, while satisfactory, still present opportunities for improvement. The findings suggest that while NUVELCO is generally effective in managing organizational processes, there is a need to strengthen adaptive capacity, particularly in managing transitions, innovations, and organizational restructuring. The People dimension, although positively rated, indicates that employee-related

systems such as engagement, motivation, and participation can still be enhanced to foster deeper organizational commitment and satisfaction. Similarly, the Quality of Work Life dimension suggests that while employees experience acceptable working conditions, further improvements in workplace well-being, stress management, and work-life balance initiatives are necessary to sustain long-term productivity and satisfaction. The Empowerment dimension, also rated Very Good, indicates that while employees are involved in organizational processes, there is still room to expand participative decision-making and increase autonomy at various organizational levels. Overall, these findings suggest that NUVELCO possesses strong OD systems but would benefit from further strengthening its human-centered and adaptive organizational practices.

The evaluation of Human Resource Management (HRM) practices yielded a grand mean of 4.42, interpreted as Very Good, indicating that NUVELCO maintains efficient, structured, and relatively advanced HR systems that effectively support both organizational goals and employee needs. This result demonstrates that the cooperative has established sound HRM mechanisms that promote employee performance, organizational discipline, and workforce development. Notably, the dimensions of Incentives, Awards, and Performance Appraisal received an Outstanding rating, reflecting highly effective recognition systems and performance evaluation mechanisms that promote motivation, accountability, and productivity. These findings suggest that NUVELCO places strong emphasis on performance-based recognition, which contributes to a culture of excellence and meritocracy within the organization.

Similarly, employee-management relations were also rated as Excellent, indicating a strong foundation of trust, collaboration, and open communication between employees and management. This positive relational dynamic is essential in fostering a healthy organizational climate and reducing workplace conflict while enhancing engagement and cooperation. However, other HRM dimensions such as Staffing Processes, Career Development, and Human Resource Development were rated as Very Good, indicating that although these systems are functional and effective, they require further strengthening to fully optimize talent acquisition, employee growth, and professional development opportunities. These findings suggest the need for more structured career progression pathways, enhanced training programs, and improved talent management strategies to support long-term organizational sustainability.

Among all HRM dimensions, Compensation and Benefits received the lowest rating, albeit still classified as Very Good. This indicates that while compensation systems are generally satisfactory, they may not fully meet employee expectations in terms of competitiveness, equity, or motivational impact. This finding highlights a critical area for policy review and improvement, as compensation plays a significant role in employee satisfaction, retention, and performance. Enhancing this dimension could significantly improve overall HRM effectiveness and employee morale. The assessment of Organizational Integrity produced a grand mean of 3.60, interpreted as Very Good, indicating that NUVELCO demonstrates a generally positive ethical climate characterized by compliance, accountability, transparency, and stakeholder engagement. However, this result also suggests that while integrity systems are in place, they are not yet fully optimized and require strengthening in certain areas to achieve higher standards of ethical excellence. Among the dimensions, Compliance with Laws and Regulations received the highest rating, indicating strong adherence to legal frameworks, organizational policies, and regulatory requirements. This reflects NUVELCO's commitment to lawful operations and institutional accountability, which is essential in public service organizations such as electric cooperatives.

Additionally, Community Engagement and Trust Building was rated as Very Good, suggesting that NUVELCO actively participates in community development initiatives and maintains a positive relationship with its stakeholders. This engagement strengthens institutional credibility and reinforces public trust, which is critical for service-oriented organizations. However, the dimensions of Ethical Leadership, Transparency, and Accountability received only a Good rating, indicating that these core governance areas require significant improvement. The findings suggest that leadership practices must further emphasize openness in decision-making, consistent accountability mechanisms, and stronger ethical modeling to enhance organizational integrity. Strengthening these areas is essential for reinforcing stakeholder trust and ensuring long-term institutional

sustainability.

The correlation analysis revealed a strong positive relationship between Organization Development (OD) practices and Organizational Integrity ($r = 0.628$), indicating that improvements in OD practices are significantly associated with higher levels of organizational integrity. This suggests that well-implemented OD initiatives—such as effective leadership systems, structured organizational processes, and employee empowerment programs—contribute meaningfully to the development of ethical behavior, transparency, and accountability within the organization. This finding underscores the critical role of OD as a foundational mechanism in shaping organizational culture and ethical standards. Similarly, Human Resource Management (HRM) practices demonstrated a strong positive relationship with Organizational Integrity ($r = 0.712$), indicating that effective HR systems play a more substantial role in promoting integrity within the organization. This suggests that HRM functions such as recruitment, performance appraisal, training, compensation, and employee relations significantly influence ethical behavior and institutional accountability. The stronger correlation of HRM with organizational integrity highlights the central role of people management systems in shaping organizational ethics and governance structures.

Furthermore, the correlation analysis also revealed a strong positive relationship between OD practices and HRM practices ($r = 0.694$), indicating that effective organizational development practices are closely linked with well-functioning human resource systems. The computed p-value of 0.001, which is lower than the 0.05 significance level, confirms that this relationship is statistically significant and not due to random variation. With 96 degrees of freedom, the result is statistically reliable and generalizable within the context of the study. Moreover, the coefficient of determination ($r^2 = 0.4816$) indicates that 48.16% of the variation in HRM practices is explained by OD practices, highlighting a substantial degree of interdependence between the two organizational systems. This finding reinforces the idea that OD and HRM are mutually reinforcing mechanisms that collectively enhance organizational effectiveness and sustainability. Based on the integrated findings of the study, a comprehensive and holistic Organizational Development (OD) intervention framework was developed. This intervention was designed in response to the observed results, which consistently indicated Very Good ratings for OD practices (4.49), HRM practices (4.42), and Organizational Integrity (3.60), as well as significant relationships among the three constructs. The findings suggest that while NUVELCO has already established strong organizational systems, there is a critical need to further integrate OD and HRM practices to maximize their impact on organizational integrity and overall performance.

The proposed intervention framework focuses on the alignment and integration of OD and HRM systems to ensure coherence in organizational processes, strengthen ethical governance, and enhance institutional effectiveness. By synchronizing leadership development, human resource systems, and organizational culture initiatives, the intervention aims to reinforce organizational values, improve employee engagement, and enhance transparency and accountability mechanisms. Ultimately, this integrated approach is designed to strengthen NUVELCO's capacity to deliver efficient services while sustaining a culture of integrity, professionalism, and continuous organizational improvement.

5. Conclusions

Based on the significant findings of the study, the following conclusions were derived:

- The respondents perceived a very good level of Organization Development (OD) practices, indicating that the organization effectively implements development strategies that support efficiency, adaptability, and overall organizational performance, while still allowing room for continuous improvement.
- The Human Resource Management (HRM) practices of NUVELCO were also perceived as very good, suggesting that HR systems are well-structured, functional, and supportive of employee development, motivation, and organizational goals.

- Organizational integrity of NUVELCO was perceived as very good, indicating that the organization generally upholds ethical standards, transparency, and accountability, although certain areas may still require strengthening.
- Organization Development practices and Human Resource Management were found to have a significant relationship with Organizational Integrity, implying that improvements in OD and HRM contribute to stronger ethical practices and organizational credibility.
- There is a significant relationship between Organization Development practices and Human Resource Management, indicating that both systems are interrelated and mutually reinforcing in achieving organizational effectiveness.
- Based on these findings, the researcher developed five (5) holistic and comprehensive Organization Development interventions aimed at strengthening HRM practices and enhancing organizational integrity.

Recommendations - Based on the conclusions of the study, the following six (6) doable and comprehensive recommendations are proposed:

- NUVELCO may sustain and further enhance its Organization Development (OD) practices by institutionalizing regular organizational assessments, employee feedback mechanisms, and benchmarking activities with high-performing cooperatives and similar service-oriented organizations. These strategies will enable the cooperative to continuously evaluate its strengths, identify areas for improvement, and remain adaptive to evolving operational, technological, and organizational challenges. Through continuous review and strategic development initiatives, NUVELCO can strengthen organizational resilience, improve internal systems, and foster a culture of innovation and growth.
- NUVELCO may undertake a comprehensive review and refinement of its Human Resource Management (HRM) policies, particularly in the areas of compensation and benefits, career advancement opportunities, professional development, and employee training programs. Ensuring that HRM policies remain competitive, equitable, and responsive to the changing needs of employees can contribute significantly to improved job satisfaction, stronger organizational commitment, enhanced employee morale, and greater workforce productivity.
- The cooperative may further strengthen organizational integrity by cultivating a culture grounded in ethical leadership, accountability, and transparency. This may be achieved through regular ethics training, reinforcement of organizational codes of conduct, and the establishment of clear systems for reporting, monitoring, and addressing ethical concerns. Strengthening integrity systems will promote trust, reinforce organizational credibility, and align employee behavior with NUVELCO's mission, vision, and core values.
- Management may adopt a more integrated organizational framework that strategically aligns Organization Development initiatives, Human Resource Management practices, and integrity-building mechanisms. A coordinated approach ensures consistency in leadership practices, policy implementation, and organizational values, thereby creating a more cohesive, effective, and purpose-driven work environment that supports both employee development and organizational excellence.
- NUVELCO may encourage stronger employee involvement in organizational decision-making through participative leadership, collaborative governance, delegation of authority, and empowerment programs. Increasing employee participation in planning, problem-solving, and policy discussions can strengthen ownership, improve engagement, stimulate innovation, and foster greater accountability across all levels of the organization.

- The organization may establish a strong monitoring and evaluation system to regularly assess the effectiveness of Organization Development and Human Resource Management interventions. By utilizing measurable performance indicators, employee feedback, and evidence-based assessment tools, NUVELCO can ensure that organizational programs remain goal-oriented, data-driven, responsive to employee needs, and continuously improved based on measurable outcomes.
- It is recommended that future studies replicate this research in different organizational settings while incorporating additional variables not examined in the present study, such as organizational culture and organizational health. Future researchers may also employ a mixed-method research design to provide deeper and more comprehensive insights into the complex relationships among organization development, human resource management, and organizational integrity, thereby enriching the existing body of knowledge in organizational and management research.

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Seagrass assessment on coastal barangays in San Antonio, Tinambac and San Ramon, Siruma Camarines Sur: An input to conservation mechanism policy

Batangoso, Carla Mae P. ✉

Central Bicol State University of Agriculture (Pasacao Campus), Philippines
(carlamae.batangoso@cbsua.edu.ph)

Belen, Allan Josh S.

Oserin, Glory Mae N.

Llaguno, Jefferson B.

Patropis, Rose

Dela Rosa, Rolly B.

Nava, John Peter B.

Belbes, Mel Alvin S.

Nolasco, Michael N.



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Abstract

This study assessed the ecological status and physico-chemical conditions of seagrass ecosystems in Barangay San Antonio, Tinambac and Barangay San Ramon, Siruma, Camarines Sur. A quantitative research design using vegetation analysis was employed, wherein five line transects were established in each site and quadrat sampling was conducted to measure seagrass species diversity, relative dominance, relative density, and percent cover. Physico-chemical parameters, including temperature, salinity, pH, and dissolved oxygen (DO), were measured using calibrated equipment, while direct observation and opportunistic sampling documented associated marine organisms and potential bioindicators present within the seagrass beds. Results showed that Barangay San Antonio has very low seagrass diversity, dominated only by *Enhalus acoroides* (EA), and exhibited highly acidic pH levels and elevated temperatures, indicating ecological stress and unfavorable environmental conditions for seagrass growth and associated marine life. In contrast, Barangay San Ramon supported multiple seagrass species, stable water quality, and abundant biological components, including corals, macroalgae, fish, mollusks, and seahorses, reflecting a healthier and more resilient marine habitat. The comparison revealed significant differences between the two areas, highlighting the influence of physico-chemical conditions on seagrass ecosystem integrity and emphasized the importance of site-specific management approaches. Based on these findings, policy recommendations

were proposed focusing on rehabilitation for San Antonio and conservation and monitoring for San Ramon.

Keywords: seagrass, species diversity, ecological status, physico-chemical parameters, bio-indicators, water quality, seagrass cover

Seagrass assessment on coastal barangays in San Antonio, Tinambac and San Ramon, Siruma Camarines Sur: An input to conservation mechanism policy

1. Introduction

Seagrasses are among the most important yet often overlooked coastal marine ecosystems in the world. These marine flowering plants play significant ecological, biological, and environmental roles in maintaining the productivity and stability of coastal waters. According to Zulkifli et al. (2021), seagrasses influence the physical, chemical, and biological processes of marine ecosystems by regulating nutrient cycling, stabilizing sediments, and improving water quality. They also provide critical habitat for many marine organisms and contribute greatly to biodiversity, food security, and climate regulation (Unsworth et al., 2022). As the only group of flowering plants capable of living entirely in marine environments, seagrasses occur across tropical, temperate, and sub-arctic coastal regions around the world (Zhang et al., 2023). Their ability to thrive in shallow marine habitats allows them to support highly productive ecosystems that serve as nursery grounds, feeding areas, and shelter for numerous marine species.

Seagrass beds are widely recognized as one of the most productive ecosystems on Earth because of their ability to support complex food webs and sustain marine biodiversity. These ecosystems provide habitat for commercially and ecologically important species such as fish, prawns, mollusks, sea turtles, dugongs, manatees, scallops, shrimps, and seahorses (Short et al., 2016). Many juvenile fish species depend on seagrass meadows during their early stages of development because the dense vegetation provides protection from predators and abundant food sources. In addition, seagrasses function as primary producers that contribute significantly to marine food chains and nutrient cycling processes. Through photosynthesis, seagrasses produce oxygen and organic matter that support surrounding marine organisms and adjacent ecosystems such as mangroves and coral reefs (McHenry et al., 2021). These ecological functions emphasize the importance of seagrass ecosystems in maintaining coastal productivity and environmental balance.

Globally, the distribution of seagrass ecosystems covers a wide range of coastal marine environments. McKenzie et al. (2020) estimated that seagrass ecosystems occupy approximately 160,387 square kilometers worldwide, with the tropical Indo-Pacific region having the largest known distribution. According to Widhah (2025), there are around 72 recognized seagrass species distributed across 159 countries and six continents, supporting more than one billion people living near seagrass habitats. Southeast Asia is considered one of the regions with the richest seagrass diversity and distribution due to its tropical marine conditions and extensive coastlines. Sudo et al. (2021) reported that seagrass ecosystems in Southeast Asia cover approximately 36,700 square kilometers. However, despite their ecological significance, seagrass habitats in the region continue to decline because of increasing anthropogenic pressures, habitat destruction, pollution, sedimentation, and climate-related disturbances.

In the Philippines, seagrass ecosystems are considered highly significant because the country possesses one of the highest seagrass diversities in the world. Lamit et al. (2017) reported that the Philippines contains 21 seagrass species belonging to nine genera and four families, representing approximately 29% of the world's seagrass species. These seagrass meadows support fisheries production, biodiversity conservation, coastal protection, and food security for many coastal communities. However, despite their ecological and economic importance, Philippine seagrass ecosystems continue to face increasing threats from coastal development, land reclamation, pollution, sedimentation, overfishing, and unregulated tourism activities (Abdulla, 2025). Fortes (2022) further explained that seagrass beds in the Philippines are declining at an estimated rate of 2.62% annually due to nutrient loading, industrial development, and sediment accumulation in coastal waters. Such threats negatively affect seagrass growth, productivity, and ecosystem stability, making conservation and monitoring efforts increasingly important.

The protection and conservation of seagrass ecosystems are supported by several environmental policies and conservation programs in the Philippines. Republic Act No. 8550, also known as the Philippine Fisheries Code of 1998, and its amended version under Republic Act No. 10654, mandate the protection, conservation, and management of coastal and marine ecosystems, including seagrass beds. Similarly, Republic Act No. 9275 or the Philippine Clean Water Act of 2004 aims to reduce water pollution and maintain water quality in coastal and marine environments, while Republic Act No. 9003 or the Ecological Solid Waste Management Act of 2000 addresses proper waste management practices that may help minimize land-based sources of pollution affecting marine habitats. Local government units also implement Coastal Resource Management (CRM) programs to strengthen environmental conservation and sustainable use of coastal resources. These programs are commonly supported by the Fisheries and Aquatic Resources Management Council (FARMC) and the Coastal Resource Management Office (CRMO), which assist in developing conservation strategies and promoting community participation in coastal management (Faustino & Madela, 2018).

In Camarines Sur, coastal municipalities such as Tinambac and Siruma possess extensive coastal areas that potentially support important seagrass ecosystems. In San Ramon, Siruma, conservation efforts are strengthened through local ordinances and environmental programs that support the sustainable management and protection of coastal resources. Castro et al. (2023) emphasized that local environmental policies and conservation initiatives are important in maintaining marine habitat stability and biodiversity. However, in some coastal areas such as Barangay San Antonio, Tinambac, limited localized policies and ecological information regarding seagrass ecosystems remain evident. Exeter et al. (2021) explained that insufficient ecological data often limits the effectiveness of environmental management strategies and conservation planning at the community level. In addition, Ward et al. (2022) highlighted that updated ecological and physicochemical information is necessary in designing science-based conservation programs and sustainable coastal management practices.

Although several studies have been conducted on seagrass ecosystems in the Philippines, limited research has focused specifically on the coastal barangays of Tinambac and Siruma, Camarines Sur. Existing studies commonly focus on mangrove ecosystems, fisheries, or general coastal resource utilization, leaving limited information regarding the ecological status and environmental conditions of seagrass habitats in these areas. Furthermore, many previous assessments concentrated mainly on species identification and distribution without integrating detailed analysis of physicochemical parameters that influence ecosystem stability and productivity. Sanchez-Delute et al. (2025) emphasized that environmental variables such as temperature, salinity, pH, and dissolved oxygen are important indicators of ecosystem health because they directly affect the growth, survival, and resilience of marine vegetation and associated organisms.

Considering the ecological importance of seagrass ecosystems and the increasing environmental pressures affecting coastal habitats, there is a need to strengthen ecological assessment and monitoring efforts in coastal communities. Comparative ecological studies between neighboring coastal areas are also important because differences in local management practices, environmental conditions, and conservation efforts may influence the condition of marine ecosystems. Understanding these ecological variations may help provide baseline information necessary for environmental planning, biodiversity conservation, coastal resource management, and sustainable policy development. Through proper assessment and continuous monitoring, seagrass ecosystems may be better protected and conserved for future generations while supporting the ecological stability and socioeconomic well-being of coastal communities.

1.1 Objectives of the Study

The main objective of this study was to assess the ecological status and physico-chemical condition of the seagrass ecosystems in Barangay San Antonio, Tinambac and Barangay San Ramon, Siruma, Camarines Sur as basis for developing conservation mechanism policies. Specifically, the study aimed to determine the ecological status of the two study sites in terms of seagrass cover, relative density, relative dominance, and species diversity. It also aimed to assess the physico-chemical condition of the sites based on salinity, temperature, water pH, and

dissolved oxygen. Furthermore, the study intended to compare the ecological status and physico-chemical condition of the two areas, identify possible bio-indicators present within the seagrass meadows, and formulate policy recommendations based on the findings of the study.

1.2 Significance of the Study

This study is important because it provides baseline information regarding the ecological status and physico-chemical condition of seagrass ecosystems in Barangay San Antonio, Tinambac and Barangay San Ramon, Siruma, Camarines Sur. The results of the study may contribute to a better understanding of the condition of seagrass meadows and the environmental factors affecting their growth and survival. The findings may benefit local government units by providing scientific data that can support the development of coastal conservation programs, environmental monitoring activities, and policy implementation. Environmental agencies such as the Department of Environment and Natural Resources and Bureau of Fisheries and Aquatic Resources may also use the results as reference for future marine resource management and habitat protection initiatives. For coastal communities, the study may increase awareness regarding the ecological importance of seagrass ecosystems and encourage participation in conservation activities. The research may also help students, researchers, and future scientists by serving as a reference for studies related to marine ecology, biodiversity, and coastal ecosystem management. Most importantly, the study may contribute to the protection and sustainability of seagrass ecosystems by identifying environmental issues affecting the study sites and recommending appropriate conservation mechanisms based on scientific findings.

1.3 Scope and Limitations of the Study

This study focused on assessing the ecological status and physicochemical condition of seagrass ecosystems located in Barangay San Antonio, Tinambac and Barangay San Ramon, Siruma, Camarines Sur. Specifically, the study concentrated on evaluating seagrass cover, relative density, relative dominance, species diversity, temperature, salinity, water pH, and dissolved oxygen within the identified seagrass beds of the two selected coastal barangays. The research was limited only to the selected study sites and focused solely on seagrass ecosystems, excluding other coastal ecosystems such as mangrove forests and coral reef communities. The study was also limited to field observations, ecological assessment, and physicochemical measurements conducted during the sampling period. Furthermore, the research did not include historical analysis of seagrass distribution, seasonal variation monitoring, GIS-based spatial mapping, or detailed assessment of anthropogenic activities and socioeconomic factors affecting the coastal environment. The findings of the study were based only on the actual data gathered during the conduct of the research in the selected coastal areas of Tinambac and Siruma, Camarines Sur.

1.4 Theoretical Framework

This study was anchored on several ecological theories that explain the relationship between environmental conditions and ecosystem functioning. The primary foundation of the study was Eugene Odum's Ecosystem Theory (1969), which explains that ecosystems are composed of interacting biotic and abiotic components that influence ecological balance and productivity. This theory supports the idea that physicochemical parameters such as temperature, salinity, pH, and dissolved oxygen directly affect seagrass growth, distribution, and survival. The study was also supported by the Biodiversity and Ecosystem Functioning (BEF) Theory of Loreau et al. (2001), which states that ecosystems with higher biodiversity tend to be more stable, productive, and resilient to environmental stress. In addition, the Indicator Species Theory of Carignan and Villard (2002) explain that certain species can serve as bio-indicators that reflect the environmental condition and health of ecosystems. Lastly, the Ecosystem Services Theory of Costanza et al. (1997) emphasizes the ecological and socioeconomic importance of ecosystems by highlighting their roles in providing food, coastal protection, carbon sequestration, nutrient cycling, and habitat support. These theories collectively provided the conceptual foundation for assessing the ecological condition, biodiversity, physicochemical parameters, and conservation importance of seagrass ecosystems in the

study areas.

2. Methodology

This study utilized a quantitative research design to assess the ecological status and physicochemical condition of seagrass ecosystems in Barangay San Antonio, Tinambac and Barangay San Ramon, Siruma, Camarines Sur. Vegetation analysis was employed to quantify seagrass cover, relative density, relative dominance, and species diversity, while physicochemical analysis was conducted to measure temperature, salinity, water pH, and dissolved oxygen. The study involved field surveys, direct observation, line transect methods, quadrat sampling, and opportunistic sampling to identify possible bio-indicators within the study areas. The selected study sites are coastal barangays located near San Miguel Bay and are characterized by shallow coastal waters, muddy to sandy substrates, and visible seagrass meadows that support various marine organisms and local fishing activities. Five transect lines with 20-meter intervals were established perpendicular to the shoreline during low tide, and sampling points were marked every five meters along each transect. A 0.5 m × 0.5 m quadrat was placed at every sampling point to assess and record seagrass species and percent cover. Species identification was based on the Field Guide on Seagrass by Mendez (2022), and samples were photographed using Geo Camera for documentation. Water quality parameters were measured on-site using calibrated probes and dissolved oxygen meters to ensure accurate readings. Statistical treatments such as dominance, relative dominance, population density, relative density, Shannon-Weiner Diversity Index, Simpson's Biodiversity Index, mean, standard deviation, and range were utilized to analyze and interpret the collected data comprehensively.

3. Results and Discussion

This section presents the results gathered from the ecological assessment and physicochemical analysis conducted in the seagrass ecosystems of Barangay San Antonio, Tinambac and Barangay San Ramon, Siruma, Camarines Sur. The discussion is organized according to the objectives of the study and includes the ecological status of the seagrass beds, physicochemical conditions of the study sites, comparison between the two areas, possible bio-indicators observed during sampling, and policy recommendations based on the findings of the study.

3.1 Ecological status of seagrass beds in San Antonio, Tinambac and San Ramon, Siruma Camarines Sur along:

a. seagrass cover; b. relative density, c. relative dominance, and d. species diversity

The ecological status of the seagrass beds in Barangay San Antonio, Tinambac and Barangay San Ramon, Siruma was assessed through the analysis of seagrass cover, relative density, relative dominance, and species diversity. These ecological parameters were used to determine the condition, composition, and distribution of seagrass species present in the study areas and to evaluate the overall health and stability of the seagrass ecosystems.

3.1.1 Seagrass Cover

The percent cover assessment in Barangay San Antonio revealed that *Enhalus acoroides* (Figure 1) was the only recorded seagrass species in the area and exhibited generally low percent cover across all transects, ranging from 1% to 14% (Table 1). Transect 3 recorded the highest cover at 14%, while Transect 4 showed the lowest cover at only 1%, indicating uneven distribution and sparse vegetation within the meadow. The low seagrass cover observed in San Antonio may suggest environmental stress conditions that limit seagrass growth and expansion. According to Christianen et al. (2019), large-bladed species such as *E. acoroides* are highly affected by poor water clarity and sedimentation because their slower growth rates reduce their capacity to recover under stressful environmental conditions. Bertelli and Unsworth (2021) also explained that meadows dominated by a single large species often exhibit lower overall cover because these species invest more energy in structural strength rather than rapid horizontal spreading.

In contrast, Barangay San Ramon, Siruma exhibited relatively higher seagrass cover across all transects, with values ranging from 25.97% to 36.72%. Specifically, Transect 1 recorded 31%, Transect 2 had 30.55%, Transect

3 showed 26%, Transect 4 had 25.97%, and Transect 5 recorded the highest cover at 36.72%. These findings indicate that seagrass beds in San Ramon are more extensive and better distributed compared to those in San Antonio, although the meadow still appeared patchy rather than continuously dense. The relatively higher seagrass cover in San Ramon suggests that the site provides more suitable environmental conditions for seagrass growth and survival.

Table 1

Seagrass Cover in San Antonio, Tinambac and San Ramon, Siruma Camarine Sur

San Antonio, Tinambac		San Ramon, Siruma
Transect No.	Seagrass Cover (%)	Seagrass Cover (%)
1	6%	31%
2	7%	30.55%
3	14%	26%
4	1%	25.97%
5	3%	36.72%

Legend: 0 – 10% - Very Low Cover (Poor Condition), 11 – 25% - Low Cover (Fair Condition), 25 – 50% - Moderate Cover (Good Condition), 51 – 75% - High Cover (Very Good Condition), and 76 – 100% - Very High Cover (Excellent Condition)

Species-specific observations in San Ramon further supported the healthier condition of the meadow. *Cymodocea rotundata* (Figure 2) consistently exhibited high cover values ranging from 43% to 72%, making it the dominant contributor to the meadow structure. According to Phang et al. (2019), *C. rotundata* commonly thrives in sandy substrates and moderate wave conditions, allowing it to maintain stable and extensive cover in tropical coastal ecosystems. Other species such as *Halodule uninervis* (Figure 3) and *Halophila ovalis* (Figure 4) also recorded moderate cover values ranging from 17% to 48% and 21% to 43%, respectively, indicating their ability to coexist within the meadow and occupy available substrate spaces. Yaakub et al. (2020) explained that these fast-growing species commonly expand in areas experiencing periodic environmental disturbances. In addition, *Thalassia hemprichii* (Figure 5) and *Cymodocea serrulata* (Figure 6) were also observed in several transects, while *Syringodium isoetifolium* (Figure 7) was sighted outside the quadrats, suggesting a more diverse seagrass community in the area. Ruiz-Frau et al. (2019) noted that *S. isoetifolium* commonly occurs in slightly deeper and more stable substrates, supporting the observed habitat conditions in San Ramon.



Figure 1. *Enhalus acoroides* (EA)

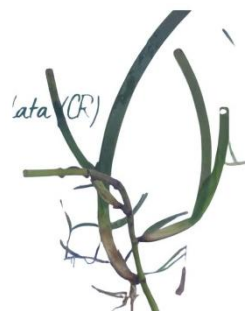


Figure 2. *Cymodocea rotundata* (CR)



Figure 3. *Thalassia hemprichii* (TH)



Figure 4. *Halodule uninervis* (HU)



Figure 5. *Halophila ovalis* (HO)



Figure 6. *Cymodocea serrulata* (CR)



Figure 7. *Syringodium isoetifolium* (HU)

3.1.2 Relative Density

The results in Barangay San Antonio revealed that *Enhalus acoroides* (EA) recorded 100% relative density across all transects (Table 2), indicating that it was the only seagrass species present in the entire study area. Although the total density values varied from 1.14 to 13.75 individuals per m², all recorded individuals belonged solely to *E. acoroides*. The complete dominance of a single species suggests a monospecific seagrass meadow where environmental conditions favor the survival and persistence of *E. acoroides*. According to Lefcheck et al. (2018), *E. acoroides* possesses extensive rhizome networks and large leaf structures that enable it to survive in soft sediment environments with moderate turbidity and unstable substrates. Similar findings by McKenzie et al. (2019) showed that *E. acoroides* commonly dominates shallow coastal habitats exposed to sediment disturbance and reduced water clarity.

Table 2

Relative Density of Seagrass Beds in San Antonio, Tinambac and San Ramon, Siruma Camarine Sur

San Antonio, Tinambac			San Ramon, Siruma	
Transect No.	Relative Density (%)		Relative Density (%)	
1	EA	100%	CR	56%
			TH	0%
			HU	20%
			HO	12%
			CS	13%
2	EA	100%	CR	57%
			TH	0%
			HU	19%
			HO	24%
			CS	0%
3	EA	100%	CR	30%
			TH	20%
			HU	33%
			HO	16%
			CS	0%

Seagrass assessment on coastal barangays in San Antonio, Tinambac and San Ramon, Siruma Camarines Sur

4	EA	100%	CR	33%
			TH	15%
			HU	21%
			HO	31%
			CS	0%
5	EA	100%	CR	48%
			TH	9%
			HU	19%
			HO	24%
			CS	0%
Legend:			Interpretation:	
CR – <i>Cymodocea rotundata</i>			0% - Absent	
TH – <i>Thalassia hemprichii</i>			1 – 25% - Low Density	
HU – <i>Halodule uninervis</i>			26 – 50% - Moderate Density	
HO – <i>Halophila ovalis</i>			51 – 75% - High Density	
CS – <i>Cymodocea serrulata</i>			76 – 100% - Very High Density	
EA – <i>Enhalus acoroides</i>				

In contrast, Barangay San Ramon, Siruma exhibited a more diverse seagrass community composed of *Cymodocea rotundata* (CR), *Thalassia hemprichii* (TH), *Halodule uninervis* (HU), *Halophila ovalis* (HO), and *Cymodocea serrulata* (CS). Among these species, *Cymodocea rotundata* consistently recorded the highest relative density values ranging from approximately 30% to 57% across the transects, indicating that it was the dominant species within the meadow. According to Aoki and McGlathery (2018), *C. rotundata* commonly thrives in sandy substrates with moderate hydrodynamic conditions and sufficient light penetration, allowing it to establish rapidly through clonal rhizome growth. Other species such as *Halodule uninervis* and *Halophila ovalis* also exhibited notable relative density values ranging from 12% to 33%, suggesting that the environmental conditions in San Ramon support the coexistence of multiple fast-growing seagrass species. Roca et al. (2016) noted that these opportunistic species usually flourish in habitats with stable substrates, favorable nutrient availability, and good water quality.

3.1.3 Relative Dominance

The results from Barangay San Antonio, Tinambac showed that *Enhalus acoroides* (EA) recorded 100% relative dominance in all five transects (Table 3). This indicates that *E. acoroides* was the only seagrass species occupying the sampled quadrats, forming a completely monospecific meadow throughout the study area. No other seagrass species were observed within the established transects. Such dominance reflects the ability of *E. acoroides* to survive under the existing environmental conditions in the area. According to Short and Coles (2002), *E. acoroides* is a large and robust species with long leaves and extensive rhizomes that enable it to tolerate shallow coastal environments with moderate disturbances and unstable substrates.

Table 3
Relative Dominance of Seagrass Beds in San Antonio, Tinambac and San Ramon, Siruma Camarine Sur

San Antonio, Tinambac			San Ramon, Siruma	
Transect No.	Relative Dominance (%)		Relative Dominance (%)	
1	EA	100%	CR	81.48%
			TH	0%
			HU	10.39%
			HO	3.74%
			CS	4.39%
2	EA	100%	CR	77.62%
			TH	0%
			HU	8.62%
			HO	13.76%
			CS	0%
3	EA	100%	CR	34.03%
			TH	15.12%
			HU	41.17%
			HO	9.68%
			CS	0%

4	EA	100%	CR	47.89%
			TH	9.89%
			HU	19.38%
			HO	42.24%
			CS	0%
5	EA	100%	CR	71.09%
			TH	2.5%
			HU	11%
			HO	14%
			CS	0%
Legend:		Interpretation:		
CR – <i>Cymodocea rotundata</i>		0% - No Dominance		
TH – <i>Thalassia hemprichii</i>		1 – 25% - Low Dominance		
HU – <i>Halodule uninervis</i>		26 – 50% - Moderate Dominance		
HO – <i>Halophila ovalis</i>		51 – 75% - High Dominance		
CS – <i>Cymodocea serrulata</i>		76 – 100% - Very High Dominance		
EA – <i>Enhalus acoroides</i>				

In contrast, Barangay San Ramon, Siruma exhibited a more diverse and structurally balanced seagrass community. Results showed that *Cymodocea rotundata* (CR) had the highest relative dominance across most transects, ranging from 34.03% to 81.48% (Table 3). Other species such as *Halodule uninervis* (HU), *Halophila ovalis* (HO), *Thalassia hemprichii* (TH), and *Cymodocea serrulata* (CS) also contributed to the meadow structure. The dominance of *C. rotundata* agrees with findings of Aoki and McGlathery (2018), who explained that this species commonly dominates sandy tropical substrates with favorable light conditions and moderate hydrodynamic activity. The coexistence of several species within the meadow suggests that San Ramon provides more suitable environmental conditions that support species interactions, habitat complexity, and ecological stability.

3.1.4 Species Diversity

The results in Barangay San Antonio, Tinambac revealed extremely low species diversity. The Shannon-Wiener Diversity Index recorded a value of 0 across all transects (Table 4), indicating the absence of species variation within the study area. All quadrats contained only one seagrass species, *Enhalus acoroides* (EA), which completely dominated the meadow. Similarly, the Simpson's Reciprocal Index recorded a value of $D = 1$ in all transects, further confirming complete dominance by a single species. According to Reynolds et al. (2013), *E. acoroides* commonly dominates shallow and disturbed coastal habitats because of its strong rhizome system and tolerance to unstable environmental conditions. However, Unsworth et al. (2018) explained that monospecific meadows generally have lower ecological resilience because ecosystem functions depend heavily on one species alone, making them more vulnerable to environmental disturbances and habitat degradation.

In contrast, Barangay San Ramon, Siruma showed higher species diversity and a more complex seagrass community structure. The Shannon-Wiener Diversity Index values ranged from 0.82 to 1.50, indicating low to moderate diversity across the transects. Five seagrass species were identified in the area, namely *Cymodocea rotundata* (CR), *Thalassia hemprichii* (TH), *Halodule uninervis* (HU), *Halophila ovalis* (HO), and *Cymodocea serrulata* (CS). Among these species, *Cymodocea rotundata* consistently recorded the highest relative abundance, followed by *Halodule uninervis* and *Halophila ovalis*. The Simpson's Reciprocal Index values ranged from 0.29 to 3.72, with Transects 3, 4, and 5 recording the highest values, indicating more balanced species distribution and greater ecological stability within those parts of the meadow. According to Roswell et al. (2021), Shannon-Wiener values between 1.0 and 3.0 generally indicate moderate species diversity and a relatively stable ecosystem. Mixed-species meadows are considered more resilient because different species contribute complementary ecological roles that improve ecosystem functioning and resistance to disturbances (Cardinale et al., 2012).

The findings of this study support the Biodiversity and Ecosystem Functioning Theory of Loreau et al. (2001), which explains that ecosystems with higher biodiversity tend to have greater productivity, stability, and resilience. The higher diversity observed in San Ramon suggests a healthier and more ecologically balanced seagrass ecosystem capable of supporting diverse marine organisms and maintaining ecosystem functions. On the other

hand, the monospecific condition observed in San Antonio reflects limited ecological interactions and reduced ecosystem resilience. Therefore, the results indicate that species diversity plays a significant role in maintaining the ecological stability and overall condition of seagrass ecosystems in coastal environments.

Table 4

Seagrass Species Diversity in San Antonio, Tinambac and San Ramon, Siruma Camarine Sur

Shannon-Wiener Diversity Index Transect No.	San Antonio, Tinambac	San Ramon, Siruma
1	0	1.5
2	0	0.82
3	0	1.32
4	0	1.23
5	0	1.23
Simpson's Reciprocal Index Transect No.		
1	1	0.29
2	1	2.04
3	1	3.72
4	1	3.69
5	1	3.01

Legend: Shannon-Wiener Diversity Index (H'), $H' < 1.0$ – No/Low Diversity (Poor Condition), $H' = 1.0 - 3.0$ - Moderate Diversity (Good Condition), $H' > 3.0$ - High Diversity (Very Good Condition), Simpson's Reciprocal Index, Ranges from 1 – S (maximum value): Higher is more diverse.

3.2 Physico-chemical condition of the study sites along: a. temperature, b. salinity, c. water pH, and d. dissolved oxygen

Physico-chemical parameters are essential in maintaining the health, stability, and distribution of seagrass ecosystems because factors such as temperature, salinity, dissolved oxygen (DO), and pH directly influence photosynthesis, respiration, nutrient absorption, and overall seagrass productivity. Variations in these environmental conditions may affect species composition, seagrass cover, and ecosystem stability (Costa et al., 2021). This concept aligns with Eugene Odum's Ecosystem Theory (1969), which explains that ecosystems function through the continuous interaction of biotic and abiotic components, where environmental conditions strongly influence the survival and distribution of organisms. The Physicochemical Parameters of the two study areas: San Antonio, Tinambac and San Ramon, Siruma are shown in Table 5.

Table 5

Physicochemical Parameters in San Antonio, Tinambac and San Ramon, Siruma Camarine Sur

Physicochemical Parameters	San Antonio, Tinambac (Mean)	San Ramon, Siruma (Mean)
Temperature	33.67°C	31.33°C
Salinity	30ppt	29ppt
Water pH	3.95	8.42
Dissolved Oxygen (DO)	7.50mg/L	8.9mg/L

Legend:

Temperature
10°C – 26°C - Optimal (Temperate)
23°C – 32°C – Optimal (Subtropical/Tropical)
30°C – 35°C - Thermal Stress/Limit

Salinity
20 – 35 ppt - Optimal/Healthy
10 – 35 ppt - Tolerant/Stable
>40 ppt - Hypersaline (Stressed)

Water pH
> 8.2 - High alkalinity
8.0 – 8.2 - Typically Healthy
7.8 – 8.0 - Normal
7.5 – 7.8 - Low pH
< 7.5 - Critically Acidic

Dissolved Oxygen (DO)
> 7.0 mg/L - Excellent/Healthy
5.0 – 7.0mg/L - Good
3.0 – 5.0 mg/L - Moderate
1.0 – 3.0 mg/L - Low/Hypoxic
< 1.0 mg/L – Very Low/Severe
0 mg/L – Anoxic (No DO)

3.2.1 Temperature

Water temperature is an important physico-chemical parameter that influences seagrass growth, metabolism, and survival because it directly affects photosynthesis and respiration (Jorda et al., 2017). Barangay San Antonio, Tinambac recorded higher temperature values of 32°C, 34°C, and 35°C, with a mean of 33.67°C, while Barangay San Ramon, Siruma recorded lower and more stable temperatures of 30°C, 32°C, and 32°C, with a mean of 31.33°C. The relatively higher temperature in San Antonio may indicate greater thermal stress, as studies have shown that prolonged exposure above 32°C can reduce seagrass productivity and photosynthetic efficiency (Beca-Carretero et al., 2020). This condition may explain the dominance of only *Enhalus acoroides* (EA) in the area, a species known for its tolerance to warmer environments. In contrast, the lower and more stable temperature in San Ramon may have provided more favorable conditions for the growth and coexistence of multiple species such as *Cymodocea rotundata* (CR), *Halodule uninervis* (HU), *Halophila ovalis* (HO), and *Thalassia hemprichii* (TH). Moderate temperatures between 28°C and 32°C are generally considered optimal for tropical seagrass development and ecosystem stability (Ruperez et al., 2019).

3.2.2 Salinity

Salinity is an important physico-chemical parameter that influences seagrass growth, nutrient absorption, and species distribution (Cambridge et al., 2017). Barangay San Antonio, Tinambac recorded consistent salinity values of 30 ppt across all sampling points, resulting in a mean of 30 ppt with no variation, indicating highly stable marine conditions favorable for *Enhalus acoroides* (EA), a species adapted to fully marine environments (Kiani et al., 2021). In contrast, Barangay San Ramon, Siruma recorded slight salinity variation of 27 ppt, 30 ppt, and 30 ppt, with a mean of 29 ppt. Although minimal fluctuations were observed, the values remain within the optimal range for tropical seagrass ecosystems. Studies suggest that moderate salinity variation may support higher species diversity by allowing species with different salinity tolerances to coexist (Ramesh et al., 2019). This may explain the presence of multiple seagrass species in San Ramon, compared to the monospecific meadow dominated by *Enhalus acoroides* in San Antonio.

3.2.3 Water pH

Water pH is an important physico-chemical parameter that affects nutrient availability, photosynthesis, and the overall physiological functioning of seagrass species (Song et al., 2025). Barangay San Antonio, Tinambac recorded highly acidic pH values of 4.3, 4.01, and 3.55, resulting in a mean pH of 3.95, which is far below the normal seawater range of 7.5–8.4. Such acidic conditions may impair photosynthesis and nutrient absorption, limiting the survival of sensitive seagrass species (Jiang et al., 2020). This condition may explain why only *Enhalus acoroides* (EA), a stress-tolerant species, was observed in the area. In contrast, Barangay San Ramon, Siruma recorded stable and slightly alkaline pH values of 8.53, 8.55, and 8.3, with a mean of 8.42, which falls within the optimal range for marine ecosystems and seagrass growth (Santos et al., 2019). The stable alkaline condition in San Ramon may have contributed to the presence of multiple seagrass species, indicating a healthier and more suitable marine environment compared to San Antonio.

3.2.4 Dissolved Oxygen (DO)

Dissolved oxygen (DO) is an important physico-chemical parameter that supports respiration, photosynthesis, and other ecological processes in marine ecosystems (Tu et al., 2025). Barangay San Antonio, Tinambac recorded DO values of 8 mg/L, 8.2 mg/L, and 6.3 mg/L, with a mean of 7.50 mg/L, indicating generally suitable oxygen conditions for seagrass survival. However, fluctuations in DO may affect root and rhizome respiration, particularly in shallow and disturbed environments (Brodersen et al., 2018), which may explain the dominance of only *Enhalus acoroides* (EA) in the area. In contrast, Barangay San Ramon, Siruma recorded higher DO values of 5.7 mg/L, 10.5 mg/L, and 10.5 mg/L, with a mean of 8.9 mg/L, suggesting stronger photosynthetic activity and better oxygen production commonly associated with productive seagrass meadows (Koch et al., 2021). The higher dissolved oxygen condition in San Ramon may have supported the presence of multiple seagrass, indicating a healthier and

more stable seagrass ecosystem compared to San Antonio.

3.3 Difference between the two study sites in terms of ecological status and physicochemical condition

The findings revealed clear differences between the ecological status of the seagrass meadows in Barangay San Antonio, Tinambac and Barangay San Ramon, Siruma. San Antonio exhibited a monospecific meadow dominated entirely by *Enhalus acoroides* (EA), with 100% relative density and relative dominance across all transects, indicating low species diversity and poor seagrass condition. In contrast, San Ramon showed a more diverse and stable seagrass ecosystem, with the presence of *Cymodocea rotundata* (CR), *Halodule uninervis* (HU), *Halophila ovalis* (HO), *Thalassia hemprichii* (TH), *Cymodocea serrulata* (CS) and the observed occurrence of *Syringodium isoetifolium* (SI). The meadow in San Ramon also exhibited higher percent cover and more balanced dominance patterns, with *Cymodocea rotundata* identified as the dominant species. Diverse seagrass meadows are commonly associated with healthier coastal ecosystems because they provide greater ecological stability, productivity, and resistance to disturbance (de los Santos et al., 2019).

The physico-chemical conditions of the two study sites also showed notable differences that may explain the variation in ecological status. San Antonio recorded more stressful environmental conditions, particularly its highly acidic pH ranging from 3.55–4.3 (mean = 3.95), which is far below the normal seawater pH range and may negatively affect photosynthesis, nutrient absorption, and seagrass productivity (Raven et al., 2020). The site also recorded higher temperatures ranging from 32°C–35°C (mean = 33.67°C), which may induce thermal stress and reduce seagrass growth (Kletou et al., 2021). Although salinity remained stable at 30 ppt and dissolved oxygen averaged 7.5 mg/L, these conditions may only favor stress-tolerant species such as *Enhalus acoroides*. In contrast, San Ramon exhibited more favorable environmental conditions, including stable alkaline pH values of 8.3–8.53 (mean = 8.42), lower temperatures of 30°C–32°C (mean = 31.33°C), slightly variable salinity of 27–30 ppt, and higher dissolved oxygen levels averaging 8.9 mg/L. These conditions are considered suitable for tropical seagrass growth and may support higher species diversity and meadow stability.

The differences observed between the two study sites support the Ecosystem Services Theory of Costanza et al. (1997), which explains that healthier ecosystems are more capable of providing essential ecological services such as habitat provision, nutrient cycling, water quality regulation, and coastal protection. The higher species diversity, better water quality, and more stable environmental conditions observed in San Ramon suggest a healthier and more functional seagrass ecosystem capable of sustaining greater ecological productivity and resilience. In contrast, the lower diversity and more stressful environmental conditions in San Antonio may reduce the ecosystem's ability to maintain ecological balance and provide ecosystem services effectively.

3.4 Possible bio-indicators in the two study sites

The biological components observed in the two study sites served as possible bio-indicators of the ecological condition of the seagrass ecosystems. In Barangay San Antonio, Tinambac, the organisms observed were mainly green algae, seaweeds, and *Padina* sp., with green algae recording the highest frequency of 10 occurrences, followed by seaweeds with 9 occurrences and *Padina* sp. with 3 occurrences (Table 6). Several quadrats in Transect 1 also showed no observed organisms, indicating low biological presence within portions of the meadow. In contrast, Barangay San Ramon, Siruma exhibited higher biological diversity, with the presence of mollusks, fish, corals, green algae, *Padina* sp., *Sargassum*, and seahorses. Mollusks recorded the highest frequency with 16 occurrences, followed by *Padina* sp. and green algae with 11 occurrences each, fish with 8 occurrences, *Sargassum* with 4 occurrences, and corals and seahorses with 2 occurrences each.

The greater diversity of organisms observed in San Ramon suggests a healthier and more stable seagrass ecosystem compared to San Antonio. The presence of mollusks indicates good sediment quality and oxygenation because these organisms are sensitive to pollution and excessive siltation (Oehlmann & Oehlmann, 2003). Fish and seahorses are also important ecological indicators because they depend on seagrass beds for shelter, feeding,

and nursery habitats, reflecting functional and productive ecosystems (Unsworth et al., 2018). The occurrence of corals further supports the suitability of the physico-chemical conditions in San Ramon, particularly its stable alkaline pH and higher dissolved oxygen levels. In contrast, the dominance of algae and seaweeds in San Antonio may indicate a simpler ecosystem structure and possible environmental stress. Although algae and seaweeds contribute to primary productivity, excessive dominance of these organisms may also suggest nutrient enrichment or reduced habitat complexity (D'Archino & Piazzzi, 2021).

Table 6

Biological Components in San Antonio, Tinambac and San Ramon, Siruma Camarine Sur

Transect No.	San Antonio, Tinambac	San Ramon, Siruma
1	None	Mollusk, Padina sp., and Green Algae
2	Seaweeds and Green Algae	Green Algae, Fish, Mollusk, and Corals
3	Seaweeds and Green Algae	Fish, Padina sp., Sargassum, Seahorse, and Mollusk
4	Padina and Green Algae	Seahorse, Mollusk, Sargassum, Padina sp., and Fish
5	Green Algae and Seaweeds	Green Algae, Mollusk, Padina sp., Fish, and Corals

The findings support the Indicator Species Theory of Carignan and Villard (2002), which explains that the presence or absence of certain organisms reflects the ecological condition of an environment. The higher diversity and occurrence of sensitive organisms such as fish, mollusks, corals, and seahorses in San Ramon indicate a more balanced and ecologically stable habitat. Meanwhile, the limited biological diversity observed in San Antonio suggests less favorable environmental conditions that may only support more tolerant organisms such as algae and seaweeds.

3.4 Policy recommendations based on the study results

The researchers aim to propose policy recommendations that promote the protection, conservation, and sustainable management of seagrass ecosystems in Barangay San Antonio, Tinambac and Barangay San Ramon, Siruma. These recommendations include strengthening environmental policies, enhancing community awareness and participation, encouraging regular monitoring of seagrass meadows, and implementing coastal management strategies that help maintain water quality, biodiversity, and overall ecosystem health.

3.5.1 Policy Recommendations for San Antonio, Tinambac, Camarines Sur

The researchers recommend strengthening community-based coastal monitoring through regular assessment of water quality parameters and seagrass cover in coordination with the LGU, BFAR, DENR-CENRO, and trained community volunteers. Water quality improvement and pollution control measures should also be implemented by identifying possible sources of acidification such as improper waste disposal, runoff, and shoreline contamination, while promoting proper waste management and vegetative buffer zones. In addition, seagrass rehabilitation zones should be established in areas with critically low seagrass cover and minimal biological presence through transplantation and habitat restoration activities supported by local environmental agencies. Environmental awareness campaigns and educational programs should also be conducted within the barangay and schools to increase community participation in coastal conservation and promote sustainable coastal resource management practices.

3.5.2 Policy Recommendations for San Ramon, Siruma, Camarines Sur

The researchers recommend establishing marine habitat protection zones, particularly in areas with high biological diversity, to regulate destructive fishing practices, anchoring, and overharvesting of marine resources through the implementation of local ordinances and active monitoring by bantay-dagat personnel in coordination with the LGU, BFAR, and DENR. Sustainable eco-tourism activities such as guided seagrass tours and marine awareness programs may also be promoted to support local livelihoods while encouraging environmental

conservation. In addition, citizen science and biodiversity documentation programs should be strengthened by encouraging residents, fisherfolks, and youth to record sightings of marine organisms using simple monitoring tools and community-based reporting systems. Regular monitoring of water quality parameters, seagrass cover, and habitat condition should likewise be continuously conducted to ensure early detection of environmental changes and maintain the ecological stability and resilience of the seagrass meadow.

4. Conclusions and Recommendations

This section presents the conclusions and recommendations based on the findings of the study. The conclusions summarize the significant results regarding the ecological status, physico-chemical condition, and possible bio-indicators observed in the seagrass ecosystems of Barangay San Antonio, Tinambac and Barangay San Ramon, Siruma, Camarines Sur. Meanwhile, the recommendations provide practical strategies and management actions for local government units, environmental agencies, community stakeholders, and future researchers to support the conservation, protection, and sustainable management of seagrass habitats.

4.1 Conclusion

The study revealed significant differences in the ecological status and physico-chemical conditions of the seagrass ecosystems in Barangay San Antonio, Tinambac and Barangay San Ramon, Siruma, Camarines Sur. Barangay San Ramon exhibited a healthier and more ecologically stable seagrass meadow characterized by higher seagrass cover, greater species diversity, balanced relative density and dominance, favorable water quality conditions, and the presence of diverse biological components such as fish, mollusks, corals, and seahorses. In contrast, Barangay San Antonio showed low seagrass cover, monospecific dominance of *Enhalus acoroides* (EA), very low species diversity, highly acidic pH conditions, and limited biological components, indicating environmental stress and reduced ecosystem complexity. The findings suggest that physico-chemical factors such as temperature, salinity, pH, and dissolved oxygen strongly influence the composition, distribution, and overall health of seagrass meadows. Furthermore, the observed biological components served as effective bio-indicators of ecosystem condition, confirming that San Ramon possesses a more productive and resilient coastal habitat compared to San Antonio. In conclusion, the study emphasizes the importance of continuous monitoring, habitat protection, and science-based management strategies to conserve and sustain seagrass ecosystems in both coastal barangays.

4.2 Recommendations

Seagrass ecosystems are among the most important coastal habitats because they provide ecological functions such as habitat provision, shoreline protection, nutrient cycling, and support for marine biodiversity and fisheries. Maintaining healthy and balanced seagrass meadows is essential for sustaining coastal productivity and environmental stability. Based on the findings of the study, the researchers recommend the following:

4.2.1 Policy Recommendations for San Antonio, Tinambac, Camarines Sur

- Strengthen Community-Based Coastal Monitoring – Establish a barangay-level monitoring program to regularly assess water pH, temperature, salinity, dissolved oxygen, and seagrass cover through coordinated efforts of the LGU, BFAR, DENR-CENRO, and community volunteers.
- Implement Water Quality Improvement and Pollution Control – Investigate possible sources of acidification and strengthen waste management, regulate shoreline dumping, and establish vegetative buffer zones to reduce pollutants entering coastal waters.
- Establish Seagrass Rehabilitation Zones – Designate degraded areas as rehabilitation zones and implement seagrass transplantation, habitat protection, and regular monitoring in coordination with the LGU, BFAR, and DENR.

- Conduct Environmental Awareness Campaigns – Organize information drives and coastal education programs to increase community awareness on the importance of seagrass ecosystems, water quality protection, and responsible coastal resource use.

4.2.2 Policy Recommendations for San Ramon, Siruma, Camarines Sur

- Establish Marine Habitat Protection Zones – Designate marine protected areas in ecologically important seagrass habitats to regulate destructive fishing, anchoring, and overharvesting of marine resources through local ordinances and community-based enforcement.
- Promote Sustainable Eco-Tourism Programs – Develop eco-friendly tourism activities such as guided snorkeling, seagrass meadow tours, and marine awareness programs to support conservation and sustainable livelihoods.
- Strengthen Citizen Science and Biodiversity Documentation – Encourage residents, fisherfolks, and youth to document marine organisms through simple monitoring tools and community-based biodiversity recording programs.
- Maintain Regular Water Quality and Habitat Monitoring – Conduct continuous monitoring of pH, salinity, dissolved oxygen, temperature, and seagrass cover to detect environmental changes and preserve the ecological stability of the seagrass ecosystem.

Implications for Schools and Educators. This study provides a local and science-based reference for environmental education by highlighting the ecological status, physico-chemical conditions, and biodiversity of seagrass ecosystems in coastal communities. The findings may help schools and educators integrate local marine conservation issues into science and environmental lessons, allowing students to better understand the importance of seagrass meadows in maintaining biodiversity, water quality, and coastal protection. The study may also encourage schools to conduct community-based environmental activities, field studies, and coastal awareness programs that promote ecological conservation and sustainable resource management.

Implications for Students. For students, the study strengthens environmental awareness and appreciation for the ecological importance of seagrass ecosystems. It helps learners understand how environmental factors such as temperature, salinity, pH, and dissolved oxygen influence marine biodiversity and ecosystem stability. In addition, the study enhances students' knowledge and skills in ecological assessment, field sampling, species identification, and environmental monitoring, while encouraging active participation in marine conservation and coastal protection efforts.

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Cultural significance and socioeconomic values of Sinarapan (*Mistichthys luzonensis*) in Lakelet Manapao, Barangay San Ramos, Buhi, Camarines Sur

Delloro, Mark ✉

Ateneo de Naga University, Philippines (mdelloro@gbox.adnu.edu.ph; mark.delloro@cbsua.edu.ph)

Eboña, Jennifer

Central Bicol State University of Agriculture, Philippines (jennifer.ebona@cbsua.edu.ph)

Mamangon, Nineveh

Central Bicol State University of Agriculture, Philippines (nineveh.mamangon@cbsua.edu.ph)

Bausa, Alvir

Central Bicol State University of Agriculture, Philippines (alvir.bausa@cbsua.edu.ph)

Parato, Maritess

Central Bicol State University of Agriculture, Philippines (maritess.parato@cbsua.edu.ph)



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Abstract

Sinarapan (*Mistichthys luzonensis*), the smallest commercially harvested food fish in the world, is endemic to the Bicol Region, with Lakelet Manapao in Buhi, Camarines Sur, as its last natural habitat and sanctuary. Past research focused on its biology, population, and conservation, but little on its cultural and socioeconomic value. This study explored these values, providing information for sustainable management and policy. Using a descriptive case study, data from 12 local respondents via Likert-scale questionnaires were analyzed with descriptive statistics. Results showed that Sinarapan has high cultural importance, with a weighted mean of 4.43, is seen as a cultural symbol and a source of community pride, and is linked to social continuity. Despite high awareness of conservation efforts, the sanctuary isn't fully integrated into local traditions. Socioeconomically, the weighted mean was 2.77, indicating neutrality; respondents reported limited economic benefits and did not perceive improvements in market activity, demand, or job creation due to fishing bans. Conservation has a limited traditional income without viable alternatives. The study highlights Sinarapan as a cultural asset with limited economic benefits. For conservation, strategies should balance ecological and cultural needs, developing sustainable livelihoods for the community.

Keywords: Sinarapan, cultural significance, socioeconomic values, conservation, ecological

Cultural significance and socioeconomic values of Sinarapan (*Mistichthys luzonensis*) in Lakelet Manapao, Barangay San Ramos, Buhi, Camarines Sur

1. Introduction

Particularly in developing nations like the Philippines, endemic freshwater species are essential to ecosystems, cultural symbols, and sources of income (Soliman, 1994). The “smallest commercially harvested food fish,” *Mistichthys luzonensis*, or sinarapan, is one such species found only in the Bicol Region's Lakes Buhi and Bato, as well as the lakeslets at Katugday and Manapao in Camarines Sur (Soliman, 1994; FishBase, 2025). Lakelet Manapao serves as a sanctuary to prevent extinction due to overfishing, habitat loss, and competition from introduced species (Soliman, 1994; Senate of the Philippines, 2008). In Buhi, Camarines Sur, sinarapan has been a traditional food and cultural symbol since the 1940s, deeply rooted in local customs, cuisine, and community identity. Every July, it plays a key role in the Sinarapan Festival, celebrating both the species and local traditions (Slow Food Foundation, 2025). Beyond its cultural importance, sinarapan is vital to the economy, supporting fishing households through trade, consumption, and processing into salted or dried products sold locally and regionally (Soliman, 1994). Small-scale fisheries are essential for rural economies and food security, underscoring the need to recognize their value for balanced development and conservation (FAO, 2021).

Although sinarapan is ecologically and socially significant, most research has focused on its biology, population, and conservation efforts, with limited attention to its cultural and economic impacts on local communities (Soliman, 1994). There is little understanding of how it influences livelihoods and social traditions in the Lakelet Manapao region. This study seeks to fill these gaps by exploring the cultural and socioeconomic importance of sinarapan to promote sustainable management and policy development. Although Lakelet Manapao is a protected sanctuary, little is known about its cultural and economic significance, making conservation of sinarapan difficult. It is difficult to develop management strategies that account for local requirements and values when data on their contributions is lacking. The effectiveness and durability of conservation efforts may be diminished as a result, making them appear constrictive or cut off from communities. Documenting how sinarapan promotes local culture, social cohesion, income, and food security—and how these elements shape community views—is essential.

2. Methodology

Research Design - This study investigated the non-market value of Sinarapan (*Mistichthys luzonensis*) in San Ramon, Buhi, Camarines Sur, using a descriptive case study. This method captured both quantitative and qualitative data, enabling a thorough analysis and offering in-depth insights into pricing trends, market behaviors, and socioeconomic impacts.

Background of the Study Site - Barangay San Ramon is an elevated community in Buhi, Camarines Sur. To the East is Mount Malinao, to the West is Mount Asog and Iriga City, to the North are the mountain ranges of Sagñay and Buhi, and to the South are the low-lying ranges of Polangui, Albay. Agriculture, including rice cultivation and coconut harvesting, is the community's primary source of income (Kopra). However, because Lake Buhi is close to Barangay San Ramon, some residents still depend on tilapia fishing there, even though Lakelet Manapao is a fish sanctuary that forbids the harvesting of Sinarapan.



Figure 1. Satellite image of Barangay San Ramon, Buhi, Camarines Sur

Respondents - A total of twelve (12) respondents residing in or near Lakelet Manapao and Buhi participated in the survey.

Field Sampling Procedure for Non-Market Value - The researchers first visited Lakelet Manapao to study its ecological and physical features. They recorded what they saw during the examination. Finally, they evaluated local knowledge, viewpoints, threats, and conservation efforts in Sinarapan through community interviews using a Likert-scale questionnaire.

Data Analysis - Calculating the weighted mean involves multiplying each data point by its assigned weight, summing the products, and dividing by the total weight. This approach is efficient when specific values in a dataset are more significant or occur more frequently. The numerical scores of a Likert-type scale can be interpreted into descriptive response categories using the figure. First, decide which score—a group mean, an individual response, or another metric—you wish to examine. Next, ascertain which of the following intervals the score falls into: 1 for severely disagree, 2 for disagree, 3 for neither/nor, 4 for agree, and 5 for highly agree. Once the range has been determined, express the score's meaning clearly using the relevant word, ranging from “strongly disagree” to “agree”. This method standardizes the discussion and communication of quantitative data, ensuring consistency and clarity in the presentation of information.

3. Result and Discussion

This section presents the study's findings on the cultural significance and socio-economic values of Sinarapan (*Mistichthys luzonensis*) in Lakelet Manapao, Buhi, Camarines Sur. The results are organized according to the research objectives and are discussed in relation to the existing literature and related studies.

Table 1

Likert-type Scale of Cultural Significance

CULTURAL SIGNIFICANCE	WEIGHTED MEAN	INTERPRETATION
Sinarapan contributes to Buhi's cultural identity.	4.92	Strongly Agree
Sinarapan contributes to our sense of community pride.	4.92	Strongly Agree
The Sinarapan Sanctuary opened opportunities for recreational activities.	4	Agree
The status of the Sinarapan fish from parts of the lake affected community morale and identity.	4.75	Strongly Agree
I am aware of the Sinarapan sanctuary and other local conservation projects in Lake Buhi.	4.67	Strongly Agree
The Sinarapan Sanctuary has led to the celebration of cultural events (e.g, Festivals, local rituals, and local celebrations).	2.75	Neutral
The Sinarapan ecosystem is crucial to our community.	5	Strongly Agree
AVERAGE	4.43	Strongly Agree

The table's mean score of 4.92 ('Strongly Agree') indicates broad agreement that Sinarapan (*Mistichthys luzonensis*) is essential to the development of Buhi's cultural identity and the forest community's sense of pride. It is intricately entwined with the local way of life, representing Buhi's history, customs, and everyday existence. Most people feel that Sinarapan increases locals' sense of pride and self-worth by fostering community and identity. Despite its cultural significance, Sinarapan Sanctuary's role in cultural events is rated "Neutral" (mean of 2.75) in the poll. Responses indicate that Buhi's festivals may not fully feature Sinarapan, offering an opportunity to enhance their cultural significance by more deeply integrating it into local celebrations. Data from surveys reveal that Sinarapan significantly shapes Buhi's cultural identity and pride. Although its role in cultural events is currently minor, there is potential to reinforce this connection. Future research could investigate community perspectives on Sinarapan and explore strategies to incorporate it more effectively into traditions and festivities.

The weighted mean of 4.43 shows that Sinarapan is highly important to the culture and social life of Buhi residents in Camarines Sur. Respondents strongly feel that the species is a key part of their local identity and fosters a shared sense of pride within the community. This finding supports Soliman and Sergio's (1997) view that endemic freshwater species are not only biological resources but also crucial cultural symbols of a community's heritage. Being internationally recognized as the "smallest commercially harvested food fish" differentiates Buhi from other towns and boosts regional and local pride (FishBase, 2025; Senate of the Philippines, 2008).

Participants highlighted that the well-being and survival of Sinarapan greatly influence their morale and sense of identity, with an average score of 4.75. This fish is deeply connected to the community's history and everyday life, functioning as a staple food and a cultural tradition since the 1940s (Slow Food Foundation, 2025). Community-conserved natural resources are crucial to their social fabric; their prosperity symbolizes continuity, whereas threats to these resources threaten their collective heritage. A perfect score of 5.00 for the statement about the Sinarapan ecosystem reflects the community's strong belief that cultural survival relies on ecological health. This aligns with the concept of biocultural diversity, which highlights the connection between culture and nature and underscores the importance of conserving both (Maffi & Woodley, 2010). In Lakelet Manapao, residents consider habitat protection essential for maintaining their traditions and way of life.

The study highlights a notable discrepancy. Respondents agree that the sanctuary provides recreational opportunities (mean score of 4.00), but remain neutral about its participation in cultural events (mean score of 2.75). This indicates that, although the annual Sinarapan Festival celebrates the species and local heritage, the sanctuary is not deeply integrated into these cultural activities. It is also observed that management plans for protected areas often emphasize biological conservation exclusively, neglecting cultural practices. As a result, the sanctuary is perceived more as a protected site rather than a component of the community's cultural identity. On a positive note, participants showed a high level of awareness (Mean = 4.67), indicating successful education and outreach about the sanctuary. Soliman (2001) pointed out that awareness is the initial step toward community participation in conservation efforts. Nevertheless, awareness by itself is not enough; for conservation to be sustainable, communities must recognize the value of these initiatives and have meaningful opportunities to participate.

Table 2
Likert-type Scale of Socio-Economic Values

SOCIO-ECONOMIC VALUES	WEIGHTED MEAN	INTERPRETATION
The Sinarapan Sanctuary increased the market opportunities for the Sinarapan Fish.	3.17	Neutral
The number of settlers and vendors selling Sinarapan fish in Buhi increased.	2.25	Disagree
The demand for Sinarapan fish in Buhi has increased.	2.5	Disagree
The Sinarapan Sanctuary increased job opportunities for local people.	3	Neutral
The Sinarapan Sanctuary opened alternative livelihood opportunities for community members.	2.92	Neutral
Average	2.77	Neutral

While the cultural value is substantial, the socioeconomic impact received an average neutral score of 2.77. This indicates that the community perceives the Sinarapan Sanctuary as having little positive influence on their livelihoods, market participation, and income sources. The result highlights the complex link between conservation initiatives and economic development, particularly when protection measures restrict access to resources traditionally used for livelihood.

Participants disagreed with the idea that the sanctuary has caused an increase in vendors, market activity, or demand for Sinarapan. This is closely related to the legal protection of Lakelet Manapao, where harvesting this species is strictly prohibited to prevent extinction (Senate of the Philippines, 2008). Historically, Sinarapan has been a vital economic resource, providing income and food for local households through direct consumption, local trade, and processing into salted or dried forms, which are sold across Bicol. The harvesting ban has effectively cut off this traditional income source, leading to a decline in market activity. This supports Moeliono's (2014) assertion that strict conservation policies often involve trade-offs—they may safeguard ecological health. However, they can also limit economic prospects for local communities that depend on the resource.

Neutral evaluations of job creation and alternative livelihoods suggest that the sanctuary has not caused economic decline nor driven growth. In the Philippines, conservation initiatives frequently face challenges due to limited funding and insufficient planning for sustainable income-generating activities. At Lakelet Manapao, there is significant untapped potential in eco-tourism and cultural heritage development. Effective protected area management usually requires community involvement in activities like tour guiding and selling local products. Without engaging communities, conservation efforts may be viewed as restrictions rather than opportunities.

It is important to recognize that these findings do not imply the sanctuary has no economic worth. As stated by the Food and Agriculture Organization [FAO] (2021), small-scale fisheries and native species possess both direct and indirect values. While conservation actions might restrict immediate economic gains, they contribute to the local and national economy via tourism, research, and ecological functions. Nonetheless, these advantages are frequently intangible or long-term and may not be apparent in residents' everyday economic experiences.

4. Synthesis and Implications

This study reveals a contradiction: Sinarapan is considered essential to local culture and identity, yet its economic significance is viewed as limited. This duality poses challenges and opportunities for sustainable management of the species and its habitat. A strong cultural connection offers a solid base for conservation efforts. When communities see a resource as essential to their identity and heritage, they are more likely to support protective measures, even if it entails personal sacrifices. This supports Soliman's (2001) view that community-based management is vital to Sinarapan's survival, as local stewardship is often more effective and sustainable than regulation alone.

On the other hand, the absence of perceived socioeconomic benefits threatens long-term sustainability. According to the United Nations Development Program [UNDP] (2015), conservation efforts are most successful when they offer tangible advantages to local communities living near and managing the resources. Without viable economic options, local families facing ongoing difficulties may lose support for the sanctuary, leading to noncompliance or reduced involvement in conservation activities. To close these gaps effectively, policy and management actions should target two main areas: first, improving resource distribution to ensure all relevant sectors receive sufficient support; and second, launching strategic training initiatives to boost workforce skills and knowledge. Concentrating on these aspects will help develop a unified strategy that addresses present shortcomings while fostering long-term sustainability and progress.

Linking Culture and Conservation: Initiatives should focus on strengthening the connection between the sanctuary and local cultural traditions. This may include establishing interpretive centers, hosting educational tours, or incorporating the site into the annual Sinarapan Festival. Such efforts will transform the sanctuary from a restricted space into a lively representation of the community's heritage, enhancing its cultural significance and

fostering a sense of ownership among community members. Enhancing Sustainable Livelihoods: Local authorities and conservation organizations should collaborate to identify and establish livelihood options that do not harm the species or its habitat. Potential alternatives include eco-tourism projects, producing memorabilia or food products that celebrate Sinarapan without using the fish itself, and skill development programs that help community members benefit indirectly from the area's conservation efforts.

5. Conclusion

This research analyzed the cultural and economic significance of Sinarapan (*Mistichthys luzonensis*) in Lakelet Manapao, Buhi, Camarines Sur, aiming to support sustainable management and policy development. The following conclusions are drawn from the gathered data. Sinarapan holds cultural importance and pride in Buhi, representing their heritage with a 4.43 mean. It is vital to their social fabric, highlighting their uniqueness as home to the world's smallest commercial food fish. Residents see Sinarapan's survival as linked to ecosystem health and traditions, showing a strong cultural-environmental bond. Though conservation awareness is high, the protected area is not fully integrated into local events, indicating room for a stronger connection.

The study found the Sinarapan Sanctuary offers minimal economic benefits, with a neutral rating of 2.77. Respondents disagreed on whether it boosted market activity, vendor numbers, or fish demand, due to regulations that prevent harvesting to protect species. Perceptions of job creation and alternative livelihoods remained neutral, indicating that conservation measures have neither harmed the economy nor created new income opportunities. This illustrates a common issue in protected area management: conservation restricts resource use without providing sufficient alternatives.

The study reveals a dual perspective on Sinarapan's worth: it is a vital cultural treasure, but the local community considers its economic value to be modest. This duality provides a solid foundation for conservation efforts but also presents a challenge. The community's cultural ties encourage support for its preservation and habitat protection, as it is seen as part of their heritage. Nonetheless, the limited perception of economic gain might threaten their long-term dedication if their needs remain unmet. In conclusion, conserving Sinarapan and managing Lakelet Manapao depend on balancing ecological, cultural, and economic interests. Success requires integrating local community values and participation to protect the species, preserve culture, and enhance quality of life.

Practical Educational Implications - To improve knowledge of biodiversity, ecology, conservation, and species preservation, the study uses regional examples. It highlights the importance of the Sinarapan Festival and the cultural legacy of Buhi, as well as the habitat needs of the Sinarapan and concerns like overfishing and habitat degradation. By highlighting the relationships between regional economies, conservation initiatives, and natural resources, the study supports sustainable development and encourages community engagement and biocultural awareness. Educators can use these insights to create guides, case studies, and courses that are more relevant by drawing on examples from specific communities. For use in educational pamphlets, posters, or digital content, information about Lakelet Manapao as a protected area, its legal status, and community viewpoints can be assembled.

Strategies that improve research abilities and link concepts to real-world problems, such as educational visits to Lakelet Manapao and conservation activities with local leaders, are supported by data. To address local issues, students could also develop minor projects, such as awareness campaigns or sustainable livelihood initiatives. Education campaigns should emphasize that conservation involves more than protecting the environment; it also includes maintaining cultural identity and improving quality of life. Balancing ecological, cultural, and economic goals helps students understand sustainable development. Limitations, such as limited information on economic benefits and cultural integration, highlight areas for further research.

Significant findings for Practitioners/Teachers, Students, and Schools - Lesson relevance and community relatability improve through evidence-based, context-specific resources you acquire. Local data serve as examples. Research links science, culture, economics, and values, aiding comprehensive teaching. Results promote

stewardship, preservation, and responsible citizenship by connecting ecological health and cultural pride. Schools, LGUs, and community organizations can collaborate to address needs identified by research, such as stronger links between the sanctuary and festivals. This info can be used to advocate for more funding for sustainable development, preservation, and environmental education in local legislation and schools.

Your identity and links to the community are strengthened as you become more conscious of your surroundings and cultural heritage. You acknowledge the significance of sinarapan and investigate conservation problems, their impacts on livelihoods, and possible remedies that promote sustainable development. You recognize that community involvement is essential to effective conservation and hold yourself accountable for safeguarding the environment and culture. You can conduct in-depth research for personal projects, whether you are looking for gaps or drawing conclusions. Professionals, leaders, and community members benefit from this experience by learning how to balance environmental preservation, cultural preservation, and sustainable growth.

The findings highlight the importance of schools in promoting culture, community, and environmental preservation. Include environmental education, practical skills, and local history in the curriculum that represent regional concerns and customs. Participate in ecotourism and cultural events, and work with NGOs and the government. To improve community ties, plan festivities and discussions, safeguard Lake Manapao and Sinarapan, and encourage sustainable livelihoods.

Recommendation

Local Government Units (LGUs) of Buhi and Camarines Sur

Incorporate Cultural Heritage into Conservation Initiatives: Research shows Sinarapan is crucial to the town's identity, so the local government should enhance ties between the Sinarapan Sanctuary and cultural events. Currently, its role is limited despite the Sinarapan Festival. Management should develop it as a cultural heritage site with exhibits and information centers on its history and ecology. Combining conservation with cultural activities encourages community ownership.

Develop Sustainable Economic Alternatives: Negative perceptions of market opportunities and livelihoods imply that conservation rules limit income sources and options. Local and national agencies should develop livelihood programs like eco-tourism, craft production, and small enterprise support. Properly managed protected areas can boost the local economy, revenue, and employment while protecting natural resources.

Enhance Policy Execution and Support: Previous studies show enforcement struggles stem from limited funding and capacity (Soliman, 2001). The local government should allocate sufficient funds to protect Lakelet Manapao. Policies need local input to balance conservation and community interests.

Community Leaders and Residents

Foster Active Involvement and Stewardship: The study shows high awareness and positive perceptions of Sinarapan and its ecosystem. Community leaders should leverage this strong identity to increase participation in sanctuary management. Creating community monitoring groups or environmental clubs can promote rule compliance and incorporate local knowledge into conservation. Communities that view resources as part of their heritage are the best protectors.

Promote Local Culture: Community members should highlight Sinarapan as a cultural symbol by sharing local stories and knowledge with visitors and the younger generation. This helps preserve cultural heritage and support the species and its habitat (Slow Food Foundation, 2025).

Environmental Agencies and Conservation Organizations

Design Strategies that Harmonize Ecology and Economy: Research shows conservation is often seen as limiting. Agencies like DENR and BFAR should adopt management approaches that recognize ecological and

socioeconomic values, including conducting feasibility studies for sustainable activities, such as educational tours and birdwatching, that generate income while protecting habitats. Moeliono (2014) says that effective conservation requires sharing benefits fairly so that local communities do not bear all the costs.

Enhance Information, Education, and Communication (IEC) Campaigns: While awareness is widespread, understanding of conservation's long-term economic benefits remains limited. Agencies should develop educational resources highlighting the non-use values and benefits of preserving Sinarapan, such as ecosystem stability, research, and heritage. A better understanding can build community support even without immediate financial gains.

Researchers and Academe

Broaden Future Research: This study focused on residents' views of Lakelet Manapao. Future research should include merchants, officials, and tourists for a fuller understanding of the species' importance. Additionally, assessing the sanctuary's economic impact on tourism and ecosystem services will provide crucial data for budget and policy decisions (FAO, 2021).

Conduct Longitudinal and Comparative Research: Periodic studies of perceptions and values are necessary to track their evolution over time, especially as policies change. Comparing Lakelet Manapao with other freshwater sanctuaries can also identify best practices to improve protected-area management nationwide.

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Filipino sa ilalim ng banyagang tinig: Paraan ng pagkatuto ng mga mag-aaral sa Filipino

Cinco, Stephen P. ✉

Leyte Normal University, Philippines (prongotpain@gmail.com)

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Abstract

Ang mga kabataan sa kasalukuyang panahon ay medyo nahihirapan sa pagkatuto ng asignaturang Filipino lalo na ang mga mag-aaral sa isang pribadong paaralan na ang wikang ginagamit ay Ingles. Layunin ng pag-aaral na ito na malaman ang mga hamon ng mga mag-aaral sa pagkatuto ng asignaturang Filipino, Anong paraan ang gingamit sa pagkatuto sa asignatura, at ano ang mga mungkahi ng mga mag-aaral sa lubusang pagkatuto ng asignaturang Filipino. Ang pag-aaral na ito ay isang kwalitatibong pananaliksik na ginamitan ng pamaraang Descriptive Qualitative Approach. Lumabas sa pagsusuri na ang mga hamon na kinakaharap ng mga mag-aaral ay ang matandaan ang mga kahulugan ng mga salita, lalim ng salita, bilis ng pagtalakay, at ang nahihirapan sa pagsasalita. Ang mga naging epekto naman nito ay ang pagbaba ng marka, kawalan ng kompyansa sa sarili, nahihirapan sa pagsasagot, at wala masyadong epekto. Lumabas din sa pagsusuri na ang mga paraan ng pagkatuto ay ang pagninilay at pagtatanon, patala ng mga bagong salita, paggamit ng internet at aklat, pagsali sa mga gawain at pagbibigay ng halimbawa ng guro. habang ang mga mungkahi naman ay ang pagbabasa ng mga aklat, mga akademikong laro, mga dula-dulaan at ang mas maraming gawain at pagsasanay. Bilang rekomendasyon palawakin pa ang pagsusuri tungkol sa mga hamon ng pagkatuto, pagbibigay ng ideya para sa panibagong ideya ng pagkatuto, at ang pakiggan ang mga mungkahi ng mga kalahok sa pagkatuto ng asignaturang Filipino.

Keywords: hamon, paraan, asignaturang Filipino

Filipino sa ilalim ng banyagang tinig: Paraan ng pagkatuto ng mga mag-aaral sa Filipino

1. INTORDUKSYON

Ang Filipino ay isa sa mga pangunahing asignaturang itinaturo sa iba't ibang antas ng edukasyon sa bansa. Mula sa elementarya, sekundarya, hanggang sa tersiyarya, ito ay nananatiling mahalagang bahagi ng kurikulum (Truya, 2020). Alinsunod sa K-12 Basic Education Curriculum ng Kagawaran ng Edukasyon, layunin ng pagtuturo ng Filipino na malinang sa mga mag-aaral ang kakayahang komunikatibo, replektibo at mapanuring pag-iisip, gayundin ang pagpapahalagang pampanitikan. Sa pamamagitan nito, inaasahang mahuhubog ang kanilang kakayahang umunawa, magpahayag, at magpahalaga sa sariling wika at panitikan.

Sa kontekstong ito, mahalagang bigyang-diin ang papel ng guro bilang pangunahing tagapagpadaloy ng pagkatuto. Ang mga guro ay hindi lamang tagapagturo ng kaalaman, kundi nagsisilbi ring modelo at tagahubog ng pag-uugali, pagpapahalaga, at personalidad ng mga mag-aaral. Sa pamamagitan ng epektibong estratehiya sa pagtuturo at makabuluhang interaksyon sa loob ng silid-aralan, natutulungan nila ang mga mag-aaral na makamit ang kanilang mga mithiin at mapaunlad ang kanilang kabuuang kakayahan. Ilan sa mga makabagong henerasyon ngayon ay nakakalimutan na ang sarili nating pagkakakilanlan. Isa sa mga halimbawa nito ay asignaturang Filipino bagama't sarili itong atin marami sa mga Pilipino ang nahihirapan matutunan ang nilalaman ng asignaturang Filipino lalo na ang mga mag-aaral mula sa isang pribadong paaralan na ang kinagisnang wika ay Ingles at ito rin ang ginagamit na salita sa pakikipag-usap sa loob ng paaralan. Nahihirapang matutunan ng mga mag-aaral ang asignaturang ito dahil sa wikang ginagamit sa pagtuturo at pagkatuto dahil sa tinatawag na *Language barrier*.

Ang pag-aaral naman nina Ruiz at Alcantara (2024), na may layuning malaman ang antas ng bokabularyo ng mga mag-aaral sa baitang 9 gamit ang anotasyon, ano naman ang antas ng bokabularyo ng mga mag-aaral sa baitang 9 na gumagamit ng *multimedia annotation* at kung mayroong pagkakaiba sa antas bokabularyo ng mga mag-aaral sa baitang 9 na gumagamit ng multimedia at papel anotasyon. Ang pag-aaral na ito ay naglalayong makita ang mga suliraning kikaharap ng mga mag-aaral sa pagkatuto asignaturang Filipino sa isang pribadong paaralan na ang midyum na wika ay Ingles. Susuriin ng mananaliksik kung ano-ano ang mga suliranin at kung anong paraan ang ginagamit ng mga mag-aaral sa pagkatuto at anong paraan naman ng pagtuturo asignaturang Filipino tulad sa pag-aaral nina Jimenez et al, (2025) na nakapokus sa ugnayan sa pagitan ng propayl ng mga mag-aaral at ng kanilang estilo ng pagkatuto; at ugnayan ng estilo ng pagkatuto at akademikong performans ng mga mag-aaral.

Ang mga naunang pananaliksik ay magsisilbing gabay sa kasalukuyang pananaliksik dahil sa halos magkatulad ang mga baryabol na ginagamit tulad ng mga mag-aaral at ang asignaturang Filipino ang kaibahan lamang ng pag-aaral, ito ay nakapokus lamang sa mga hamon ng mga mag-aaral sa pagkatuto ng asignaturang Filipino at ang mga paraang ginagamit ng mga mag-aaral sa pagkatuto at ang mungkahi para sa lubusang pagkatuto sa asignaturang Filipino. Ang pag-aaral na ito ay nakapokus din sa paraan ng pagkatuto, hamon at mungkahi ng mga mag-aaral sa pagkatuto sa asignaturang Filipino. ang pagkakaiba nito sa mga naunang pag-aaral. Kung sapag-aaral nina Ruiz at Alcantara ay naka pokus sa ika-9 na baitang ang pag-aaral na ito naman ay naka pokus sa ika-6 na baitang sa isang pribadong paaralan.

Layunin Ng Pag-Aaral - Layunin ng pag-aaral na ito na matukoy ang mg hamon at makuha ang kanilang mga mungkai patungkol sa pagkatuto sa asignaturang Filipino, ang mga sumusunod na katanungan na magsisilbing gabay na layunin;

- Anong hamon sa mga mag-aaral sa pagkatuto ng asignaturang Filipino?
- Anong paraan ang ginagamit ng mga mag-aaral sa pagkatuto ng asignaturang Filipino?

- Anong mungkahi ng mga mag-aaral para sa lubusang pagkatuto ng asignaturang Filipino?

Saligang Teoritikal - Ang pag-aaral na ito ay nakatuon sa paraan at hakbang sa pagkatuto ng mga mag-aaral sa asignaturang Filipino, na nakabatay sa ilang mahalagang teorya sa edukasyon. Isa sa mga pangunahing teorya ay ang *Teoryang Constructivism ni Jean Piaget*, na nagsasaad na ang pagkatuto ay isang aktibong proseso kung saan ang mga mag-aaral ay bumubuo ng sariling kalaaman batay sa kanilang karanasan. Sa ganitong pananaw ang mga mag-aaral ay hindi lamang tumatanggap ng impormasyon, kundi aktibong nakikilahok sa pagbuo ng kahulugan, na nagreresulta sa mas malawak na pag-unawa sa bawat paksa. Ayon pa kay Yangiling (2024), na ang Konstruktubismo ay mahalaga sa para sa pagtuturo at pagkatuto ng mga mag-aaral upang madaling maunawan at malaman ang kabuoang paksa.

Ang teoryang *Social Constructivism* naman ni *Lev Vygotsky*, ay nabibigay diin sa papel ng interaksyong panlipunan sa pagkatuto. Ayon sa teoryang ito ang pagkatuto ay higit na napauunlad sa pamamagitan ng pakikipag-ugnayan ng mga mag-aaral sa kanilang kapwa at maging sa kanilang guro. Ayon pa kay Mercadal (2024), ang *Social Constructivism* ay isang balangkas teoretikal sa larangan ng agham panlipunan na tumatalakay kung paano nabubuo ang kaalaman, identidad, at realidad sa pamamagitan ng mga interaksyong panlipunan at kontekstong kultural. Ipinapalagay nito na ang mga penomenang panlipunan na karaniwang itinuturing na likás ay, sa katunayan, mga produktong hinuhubog ng kultura at lipunan, na patuloy na nagbabago at umuunlad sa paglipas ng panahon.

Ang mga teoryang ito ay magiging gabay sa pag-aaral upang matukoy ang pagkatuto at kung ano ang paraang ginagamit ng mga mag-aaral upang maunawaan ang paksang pinag-aaralan. Gamit ang *Teoryang Constructivism at Social Constructivism* bilang gabay sa pag-aaral. Bibigyang tugon ng teoryang *Constructivism* ang mga karanasang kanilang naranasan sa pagkatuto ng asignaturang Filipino, kung sa anong paraan nila natutunan ang bawat paksa, habang ang *Social Constructivism* naman ay bibigyang tugon ang mga naging katuwang ng mga mag-aaral sa pagkatuto ng mga mag-aaral sa asignaturang Filipino.

Kahalagahan Ng Pag-Aaral - Ang pag-aaral na ito ay mahalaga sa mga mag-aaral maging sa mga guro. mahalaga ang pag-aaral na ito sa mga mag-aaral na nahihirapang matuto sa asignaturang Filipino makikita sa pag-aaral na ito ang mga paraang ginamit ng mga kalahok upang mapadaling matutunan ang pagkatuto sa asignaturang Filipino. Mahalaga rin ito sa mga gurong nagtuturo ng asignaturang Filipino bilang gabay kung sa anong paraan madaling maunawaan ng mga mag-aaral na ang wikang Ingles ang ginagamit sa pagkatuto. Magagamit ang magiging resulta ng pag-aaral na ito sa mabilasan at madaling paraan ng pagkatuto sa asignaturang Filipino.

Saklaw At Limitasyon - Saklaw ng pag-aaral na ito na malaman ang mga hamon, paraan na ginamit at mungkahi ng mga mag-aaral sa pagkatuto ng mga mag-aaral para sa lubusang pagkatuto ng asignaturang Filipino. Nililimitahan naman ng pag-aaral na ito ang mga naging mismong hamon at paraan ng pagkatuto sa asignaturang Filipino na naranasan ng mga mag-aaral sa Tacloban Angelicum Learning Center na nasa ika-6 na baitang.

2. Metodolohiya

Inilahad sa kabanatang ito ang mga pamamaraang ginamit ng mananaliksik kabilang ang desinyo ng pag-aaral, kaligiran ng pag-aaral, at paraan ng pangngalap ng datos.

Disenyo Ng Pag-Aaral - Ang pag-aaral na ito ay isang kwalitatibong pananaliksik na ginamitan ng pamaraang *Descriptive Qualitative Approach*. Ang *Descriptive Qualitative Approach* ay isang metodolohikal na dulog na naglalayong mabigyan ng masinsinan, malinaw, at tuwirang paglalarawan ang isang karanasan, pangyayari, o phenomenon habang ito ay likas na nagaganap. Layunin din nitong maglahad ng malinaw at makatotohanang buod ng mga datos gamit ang pang-araw-araw na wika (Ayton, 2024). Ang disenyo at pamamaraang ito ay naangkop sa pag-aaral na isinagawa dahil ang pananaliksik na ito ay naglalayong malaman o ang mga hamon, paraan ng pagkatuto at mungkahi ng mga mag-aaral sa asignaturang Filipino.

Instrumento Ng Pananaliksik - Upang makalikom ng sapat at makabuluhang datos, ginamit ng mga

mananaliksik ang isang *semi-structured interview guide* bilang gabay sa pagsasagawa ng panayam sa mga kalahok. Sa pamamagitan nito gagamitin ng mananaliksik bilang gabay sa pangangalap ng datos na may koneksyon sa mga hamon, paraan g pagkatuto at ang mga mungkahi sa pagkatuto ng mga mag-aaral sa asignaturang Filipino. Ginamit din ang *field notes* upang maitala ang mahahalagang pahayag, kilos, reaksiyon, at iba pang obserbasyon na lumitaw sa panahon ng panayam at interaksiyon sa komunidad. Kalakip nito, gumamit ang mga mananaliksik ng audio recorder at mobile documentation upang matiyak ang katumpakan ng mga sagot ng mga kalahok, makakuha ng mga larawan ng mga kagamitan, at maging malinaw at maayos ang transkripsyon ng mga panayam.

Pagpili ng Kalahok - Ang mga kalahok ng pag-aaral ay binubuo ng mga mag-aaral mula sa Tacloban Angelicum Learning Center na na sa ika anim na baitang. Tinatayang lima hanggang sampung mag-aaral pinili sa pamamagitan ng *Convenient Sampling* sapagkat natamo na ang *data saturation*. Ayon kay Nikolopoulou (2023) ang *Convenience Sampling* ay isang uri ng *non-probability sampling* kung saan ang mga kalahok ay pinipili batay sa kanilang kadalian sa paglapit o pag-access ng mananaliksik. Maaaring ito ay dahil sa kanilang lokasyong heograpikal na malapit, pagiging available sa takdang oras, o kahandaang makilahok sa pananaliksik. Tinatawag din itong *accidental sampling*, at ito ay kabilang sa mga paraang *non-random sampling* dahil hindi gumagamit ng sapalarang pagpili ng mga kalahok. Ang pag-aaral na ito ay isinagawa sa Tacloban Angelicum Learning Center na kung saan ang mga mag-aaral dito ay mas madaling maintindihan at matutunan ang mga asignaturang gumagamit ng wikang Ingles at nahihirapan sa pagkatuto ng asignaturang Filipino.

Paraan Ng Pangangalap Ng Datos - Isinagawa ang pangangalap ng datos sa pamamagitan ng magkakaugnay na hakbang. Sa pagsisimula ng pangangalap ng datos, ibinigay ang *consent form* sa bawat kalahok upang humingi ng pormal na pahintulot sa panayam, gayundin ang pagkuha ng larawan at *audio-recorder* bilang bahagi ng pag-iimbak ng datos. Pagkatapos nito, isinagawa ang *semi-structured interviews* sa paraan ng *pakikipagkuwentuhan at pagtatanong-tanong* sa mga napiling kalahok. Ang *pakikipagkuwentuhan* ay isang palitang-salaysay na nakabatay sa tiwala, pagkakapantay, at pakikipagkapwa.” (Enriquez, 1992). “Ang *pagtatanong-tanong* ay hindi lamang pagkuha ng impormasyon kundi isang proseso ng pakikipag-ugnayan na ginagabayan ng pakiramdam at pakikipagkapwa.” (Enriquez, 1992).

Pagsusuri Ng Datos - Pagkatapos ng pangangalap ng datos, isinailalim sa isang masusing transkripsyon ng mga panayam upang malinaw at maayos na ma-proseso ang bawat pahayag ng kalahok. Sinundan ito ng coding at *thematic analysis*. Ayon kina Ahmed et al, (2025) Ang Thematic Analysis ay isang pamamaraang kwalitatibo sa pananaliksik na ginagamit upang tukuyin, suriin, at bigyang-kahulugan ang mga *pattern* o tema ng kahulugan na lumilitaw sa loob ng datos. Angkop ang pamamaraan na ito upang malalimang masuri at mailarawan ang mga pahayag ng mga kalahok kaugnay sa mga naging hamon, paraan ng pagkatuto at ang mga mungkahi ng mga mag-aaral sa pagkatuto ng asignaturang Filipino.

3. Resulta at diskusyon

Ang bahaging ito, ay naglalaman ng mga resulta na nakuha mula sa pagtitipon at pagsusuri ng datos. Inilahad ang mga natuklasang datos batay sa mga kasagutan ng mga mag-aaral mula sa ika anim na baitang tungkol sa pagkatuto ng sa asignaturang Filipino, makikita dito ang mga hamon, paraan na ginagamit ng mga mag-aaral at mga mungkahi sa lubusang pagkatuto ng asignaturang Filipino. Makikita ang mga lumitaw mula sa pagsusuri at obserbasyon gamit ang iba’t ibang metodo o pamamaraan. Kasunod nito ay ang pagpapaliwanag ng interpretasyon ng mga datos batay sa layuning ng pag-aaral.

Mga hamon sa Pagkatuto ng Filipino - Makikita rito ang iba’t ibang hamon na kinakaharap ng mga mag-aaral upang matuto sa asignaturang Filipino. Ang sumusunod na mga talahanayan ay bahagi ng naging resulta mula sa mga datos na nakuha sa pakikipanayam

Makikita sa talahanayan 1.1. ang mga kahirapan sa pagkatuto ng mga mag-aaral sa asignaturang Filipino. ito ay kinabibilangan ng kahirapang matandaan ang kahulugan ng mga salita. hinid lingid sa ating kaalaman na sa panahon ngayon ang mga bata ay nahihirapan ng intindihin ang sarili nating wika, sapagkat maoobserbahan natin

na kalimitang ginagamit ng mga bata ngayon ay gumagamit ng wikang Ingles, lalo na kung ang mga bata ay nag-aaral sa isang pribadong paaralan na ang wika ay Ingles. Ang kahirapang pag-intindi ay isa sa mga kahirapang kinakaharap ng mga mag-aaral katulad sa nabanggit ng isa sa mga kalahok;

“Nahihirapan ako minsang tandaan yung mga terms na ginagamit sap ag-identify sa sentence na ginagamit sa pagtatalakay.” -kalahok 6-

Talahanayan 1.1.

Kahirapan sa pag-unawa ng mga aralin sa Filipino

Mga Kahirapan	Mga Tugon	Pagpapakahulugan
Matandaan ang mga Kahulugan ng mga salita.	“Sometimes it’s hard to memorize the term that we use to identify what kind of sentence is it.” - <i>Kalahok 1</i>	Ang kahirapan sa pag-intindi ng mga salita ay ang siyang pinakamahalagang parte ng pagkatuto sapagkat ito ang pangunahing hakbang upang madaling matutunan ang bawat pinapaksa sa isang aralin. Dahil mahirap intindihin ang mga salita ito ang nagiging rason ng mga mag-aaral upang mahirapan din sa pagkatuto sa asignaturang Filipino.
	“Minsan nahihirapan akong tandan ang mga salita pa ma identify kung ano ang ibig sabihin” - <i>Kalahok 5</i>	
	“It is sometimes hard for me to remember the words” - <i>Kalahok 8</i>	
Lalim ng salita	“Nahihirapan ako kapag malalim na salita ang ginagamit ng aming teacher.” - <i>Kalahok 2</i>	Isa sa mga nagpapahirap sa pagkatuto ng mga mag-aaral sa asignaturang Filipino ay ang paggamit ng malalalim na salita ng kanilang guro na hindi maintindihan ng mga mag-aaral.
Bilis ng pagtatalakay	“Nalilito rin ako kapag mabilis ang discussion.” - <i>Kalahok 2</i>	Ang mabilis na pagtuturo ay siya ring dahilan kung bakit nahihirapan ang mga mag-aaral na matutunan ang asignaturang Filipino.
Nahihirapan sa pagsasalita	“One of the factors that affect my learning is the difficulty to pronounce some words” - <i>Kalahok 1</i>	Isa rin sa mga hamon ng mga mag-aaral ang pagsasalita ng tuwid sa Filipino, nahihirapan an mga mag-aaral na gamitin ang mga salitang Filipino sa kanilang asignatura sa kadahilanang hindi nila maintindihan ang isang salita.
	“Nahihirapan akong magsalita ng Filipino.” - <i>Kalahok 2</i>	
	“Nakakaapekto sa aking pagkatuto ang kakulangan ko sa bokabularyo at hirap ako sa pagbigkas ng mga salita.” - <i>Kalahok 3</i>	

Nabanggit ng mga mag-aaral ang kahirapang matandaan ng kahulugan ng isang salita dahil ito ang nagiging rason ng kahirapan sa pagkatuto ng mga mag-aaral. Ayon sa pag-aaral nina Olarte et al., (2025) na ang kahirapan sa wikang Filipino ay hadlang sa pagkatuto ng mga mag-aaral na nagiging sanhi ng kakulangan ng ideya sa o pagkatuto sa asignaturang Filipino. Ang kahirapang intindihin ang mga salita ay isa sa mga nagpapahirap o isa sa mga hamon ng mga mag-aaral sa pagkatuto ng asignaturang Filipino.

Narito rin ang lalim ng mga salita na ginagamit ng guro sa pagtuturo, isa rin sa nagpapahirap sa pagkatuto ay ang lalim ng mga salitang ginagamit ng guro, dahil sa napakalalim na termino ay hindi na maintindihan o maunawaan ng mga mag-aaral ang ibig sabihin ng salita. Katulad sa nabanggit ng isa sa mga kalahok;

“Nahihirapan ako kapag malalim na salita ang ginagamit ng aming teacher.” -kalahok 2-

Sa pagtuturo ng Filipino ay hindi dapat gumamit ng mga salita na indi naiintindihan, bilang guro kailangang gumamit ng mga salitang madaling maunawaan ng mag mag-aaral. Sa inilathala nina Imperial at Ong (2021), ang mahihirap na salita o *Lexical Complexity* ay may direktang epekto pag-unawa at readability ng mga teksto sa mga bata. Makikita sa kanilang pag-aaral ang mga maaring maging epekto ng paggamit ng mga malalalim na salita sa pagtuturo sa mga bata.

Makikita rin sa talahanayan 1.1 ang bilis ng pagtatalakay, sa pagtuturo hindi kaalamanagang mabilis sa pagtatalakay ng paksa, sapagkat ito ay maaring maging rason sa hindi pagkaintindi ng mga mag-aaral sa paksang tinatalakay. Kinakailangan naayon lamang sa standard ng mga mag-aaral ang bilis ng pagtuturo sa lalo sa asignaturang Filipino, katulad na lamang sa nabanggit ng isang kalahok;

“Nalilito rin ako kapag mabilis ang pagtuturo ng aming teacher sa discussion” -kalahok 2-

Isa sa mga dapat gawin sa pagkatuto ay ang lubusang pag-intindi sa paksa, hindi kailanagng bilisan ang paraan ng pagtuturo kung hindi ito nahahabol ng mga mag-aaral at naidadagdag sa kanilang pagkatuto. Nabanggit nina Prichett at Beatty (2015), kapag masyadong mabilis ang pacing ng pagtuturo, nagkakaroon ng mababang antas ng pagkatuto at maraming estudyante ang naiiwan. Kapag mabilis ang pagtuturo marami ang hindi nakakahabol lalo na sa asignaturang Filipino na isa sa mga nahihirapang asignatura ng mga mag-aaral sa pribadong paaraln.

At ang huli makikita rin sa talahanayan 1.1 ang nahihirapan sa pagsasalita ng wikang Filipino. Hindi na ito bago sa panahon ngayon sapagkat maraming kabataan ang nahihirapan sa pagsasalita ng wikang Filipino dahil na mismo sa mga makabagong palataporma tulad ng youtube, facebook at iba pa kaya nahihirapan na ang mga kabataan ngayon na masalita ng wikang Filipino. Katulad na lamang sa nabanggit ng isa sa mga kalahok;

“One of the factors that affect my learning is the difficulty to pronounce some words” -kalahok 1-

Ang wikang Ingles ang modyul ng mga nasabing palataporma na siya namang ginagaya ng mga bata, dahil sa halos araw-araw na panunood ng mga ito nasasanay na ang mga ito sa paggamit ng Ingles. Nabanggit sa pag-aaral nina Umrah et al, (2025), na gingamit ng mga estudyante ang social media platform tulad ng youtube, facebook at tiktok upang mapahusay ang kanilang wikang Ingles, kabilang ang pagsasalita at bokabularyo, dahil sa patuloy na paggamit sa wikang Ingles.

Talahanayan 1.2

Epekto ng mga hamon sa pagkatuto

Mga Epekto	Mga Tugon	Pagpapakahulugan
Pagbaba ng marka	“Bumababa ang grades ko sa mga quiz” - Kalahok 2	Isa mga epekto nito ay ang pagbaba ng marka na isa sa mga hamon ng mga mag-aaral sa kanilang pag-aaral, Ito ang nagiging resulta sa mga kahirapng kinaharap ng mga mag-aaral sa pagkatuto ng asignaturang Filipino.
Kawalan ng kompyansa sa sarili	“Nawawalan ako ng confidence na sumagot sa klase” - Kalahok 6	Nawawalan ng kompyansa sa sarili ang mga mag-aaral dahil sa mga hamon na kinakaharap sa pagkatuto ng asignaturang Filipino.
Nahihirapan sa pagsagot sa recitation	“Dahil dito, nahihirapan akong sumagot sa recitation at ipaiwanag ang aking sagot.” - Kalahok 3	Nawawalan ng lakas ng loob ang mga mag-aaral na sumagot sa recitation sa kadahilanang nahihirapan sila sa mga hamon ng pagkatuto ng asignaturang Filipino.
Wala masyadong epekto	“It doesn’t really affect my performance because I can always ask my teacher or I could use search engine to help me” - Kalahok 1 “hindi naman masyadong naapektuhan yung performance ko kasi pwede akong magtanong sa teacher.” - Kalahok 5	Hindi masyadong naapektuhan ang performance dahil ang mga mag-aaral ay malayang natatanong sa kanilang mga guro at gumagamit sila ng iba’t ibang palataporma sa media na ginagamit upang makuha ang ibig-sabihin ng paksang gusto nilang matutunan.

Makikita sa sa talahanayan 1.2 na ang mga epekto sa mga hamon ay kinabibilangan ng pagbaba ng marka, na kung saan isa sa mga magiging resulta sa mga kinakaharap na hamon ng mga mag-aaral. Ang pagbaba ng marka ay ang resulta ng mga hamon ng mga mag-aaral katulad sa nabanggit ng isa sa mga kalahok na;

“Bumababa ang grades ko sa quiz at nawawalan ako ng confidence na sumagot” -kalahok 2-

Ang pagbaba ng marka ay labis na nakaaapekto sa mga mag-aaral isa sa mga dahilan ng pagbaba nito ay ang kahirapang matuto sa paksang tinalakay ng guro sa asignaturang Filipino lalo na sa isang pribadong paaralan na ang wikang ginagamit ay Ingles. Sa pag-aaral nina Ruiz at Alacntara (2024), lumabas sa pag-aaral na ang paggamit ng mga tekso at multimedia platform ay nakatutulong sa pagkatuto ng mga mag-aaral, nagbibigay sa mga mag-aaral ng ideya upang masmadalin matutong gumamit sa pagsasalita. Makikita sa pagkatuto ng mga mag-aaral ang gawi o paraan ng pagkatuto ng mga mag-aaral upang madaling matutunan ang kanilang paksa at hindi bumaba ang kanilang mga marka.

Makikita rin sa talahanayan 1.2 na isa rin sa mga epekto nito ay ang hindi pagsali ng mga mag-aaral sa mga gawain at nahihirapan sa pag-*recite*. Dahil sa hindi maunawan ng mga mag-aaral ang paksa, hindi nalamang nakikilahok ang ilan sa mga mag-aaral sa gawain sa klase tulad sa sinabi ng ilan sa mga kalahok;

“Nawawalan ako ng confidence na sumagot sa klase”-kalahok 6-

“Dahil dito, nahihirapan akong sumagot sa recitation at ipaiwanag ang aking sagot.”-kalahok 3-

Ang pagkawala ng lakas ng loob sa pagsagot sa klase ay epekto ng hindi gaanong pagkaunawa sa paksang tinalakay. Nabanggit sa pag-aaral ni Inocente (2024), na hindi kayang ilabas o ihayag ang naiisip ng mga mag-aaral ang isang rason na kung bakit hindi nagrerecite ang mga mag-aaral. Lumabas din na na ang pagkawala ng lakas ng loob na ihayag ang kanilang saloobin o ideya at ang hindi alam ang wikang ginagamit o kahulugan nito sa asignaturang pinag-aaralan. Makikita sa pag-aaral na ang rason ng pagkawala ng lakas na loob na sumali sa gawain ay ang hindi masyadong ideya sa paksa o nahiihiya dahil sa kanyang bokabularyong ginagamit sa Filipino.

Kabilang din dito sa talahanayan 1.2 ang wala masyadong epekto dahil sa pagtatanong sa guro at paggamit ng search engine. Batay sa nakalap na datos may ilang mag-aaral ang hindi masyadong naapektuhan ng mga hamon katulad ng nabanggit ng ilan sa mga kalahok;

“It doesn’t really affect my performance because I can always ask my teacher or I could use search engine to help me”-kalahok 1-

“Hindi naman masyadong naapektuhan yung performance ko kasi pwede akong magtanong sa teacher.”-kalahok 5-

Ang pagtatanong sa guro at paggamit ng search engine ay ang ginawang paraan ng mga mag-aaral upang magkaroon ng ideya at maging wasto ang kaalamang nakukuha ng mga mag-aaral sa tulong at gabay ng guro at ng search engine. Nabanggit sa pag-aaral nina Umrah et al, (2025), na gingamit ng mga estudyante ang social media platform tulad ng youtube, facebook at tiktok upang mapahusay ang kanilang wikang Ingles, kabilang ang pagsasalita at bokabularyo, dahil sa patuloy na paggamit sa wikang Ingles na ginagamit upang magkaroon ng ideya ang mga mag-aaral.

Mga Paraan ng Pagkatuto ng Filipino - Ang pagkatuto ay hindi basta-basta, kinakailanangan ng masusing pamamaraan katulad ng mga estratehiya ay istilo ng pagkatuto. Makikita sa susunod na talahanayan ang iba’t ibanag paraan ng pagkatuto ng mga mag-aaral sa isang pribadong paaralan sa asignaturang Filipino.

Talahanayan 2

Mga Paraan ng Pagkatuto

Mga Paraan	Mga Tugon	Pagpapakahulugan
Pagninilay at Pagtatanong	“I ask myself a question about the lesson and check if my answers are correct”	Tinatanong ng mga mag-aaral ang kanilang sarili at pinagninilayan kung tam aba ang kanilang pagkakaintidi sa paksang tinatalakay sa asignaturang Filipino. Tinatanong kung tam aba ang mga kasagutan sa kanilang isipan.
	- Kalahok 4	
	“I make my own questions about the lesson and correct my mistakes”	
	- Kalahok 5	

Pagtala ng mga bagong salita	“Nag no notes ako ng new words at nagtatanong sa kaklase kapag hindi ko gets” - Kalahok 2	Ang pagsusulat ng mga mahahalagang impormasyon ay isa sa mga paraan ng mga mag-aaral upang madaling matuto sa asignaturang Filipino.
Paggamit ng Internet at Aklat	“I use the internet to scan and simplify my topics” - Kalahok 1 “I use the internet to make the lesson easier and my books to understand more.” - Kalahok 8 “I use the internet to make the lesson easier to understand and use books for more details.” - Kalahok 6	Ang mga mag-aaral ay ginagamit ang internet upang maintindihan ang mga paksa hindi masyadong maunawaan. Ginagamit ang internet bilang gabay sa pagkatuto ng mga mag-aaral kasabay nito sinasabayan rin ng pagbabasa ng aklat upang mas maging malinaw sa mga mag-aaral ang paksa ng tinatalakay upang mapadali ang kanilang pagkatuto.
Pagsali sa mga gawain	“Para maintindihan ko ang lesson, sumasagot ako ng quiz at sumasali sa mga activity sa klase. Nakatutulong ito para masanay ako.” - Kalahok 3	Ang pagsali at pagsagot sa mga gawain ay isa sa mga paraan ng mga kalahok upang madaling maintindihan at maunawaan ang paksa sa isang talakayan.
Pagbibigay ng halimbawa ng guro	“Mas naiintindihan ko kapag may example si teacher at kapag nagkakaroon ng group work” - Kalahok 2	Ang pagbibigay ng halimbawa ng guro ay isa sa mga pinagmumulan ng kaalaman ng mga mag-aaral upang mas mapadali ang pagkatuto ng mga mag-aaral.

Makikita sa talahanayan 2 na ang mga paraan ng pagkatuto ay ang pagninilay at pagtatanong sa sarili, pagtala ng mga bagong salita, paggamit ng internet at aklat, pasali sa mga gawain, at pagtatanong sa guro ang mga paraan na ito ay nagsisilbing gabay o paraan na gingamit ng mga mag-aaral upang mapadali ang kanilang pagkatuto. Ang pagninilay at pagtatanong sa sarili sa mga paksa na hindi masyadong maunawaan ay isa sa mga paraan ng pagkatuto tulad sa nabanggit ng isa sa mga kalahok;

“I ask myself a question about the lesson and check if my answers are correct”-kalahok 4-

Ang pagagatanong sa sarili ay hindi masama, ang ganitong paraan ay may tinatawag na *self-realization* sa wikang Ingles nagsisilbing ebalwasyon ng sariling kaisipan kung tama ba ang o hindi ang pagkaintindi sa na sabing paksa. Sa inilathala ni McLeod (2025), ang pagninilay ay isang proseso kung saan iniisip ng mag-aaral ang kanyang karanasan upang mas maunawaan ang aralin. Ayon din kay David A. Kolb, ang pagkatuto ay mas nagiging epektibo kapag dumaraan sa siklo ng karanasan, pagninilay, pag-aanalisa, at aplikasyon

Kabilang rin sa talahanayan 2 ang pagtatala ng mga bagong salita naman ay isa rin sa mga paraan upang matuto ang mga mag-aaral at upang makakuha rin ng panibagong kaalaman na para sa mga mag-aaral ay ay bago pa ang paksa para sa kanila, halimbawa nalamang sa nabanggit ng isa sa mga kalahok;

“Nag no notes ako ng new words at nagtatanong sa kaklase kapag hindi ko gets”-kalahok 2-

Mahalaga ang pagtatala ng mga salita o bagong paksa sa loob ng isang talakayan upang magsilbing gabay at magamit sa araw-araw na pagkikipagtalastasan. Ito ay mahalaga upang mapadali ang pag-aaral ng mga bagong paksa na pinag-aaralan. Sa inilathala ni Kylo (2020), kapag ang mag-aaral ay nagtatala ng panibagong paksa, pinoproseso ang impormasyon. Binibigyang diin ang mahalagang detalye, pinag-uugnay ang mga ideya at hinahati ang isang malawak na paksa sa maliit na bahagi. Ang aktibong pakikilahok sa impormasyon ay nagpapatag ng posibilidad na maalala ang ilan, kung hindi man lahat ng iyong natutunan. nabanggit ng inilathala na kung gaano kahalaga ang pagtatala ng panibagong paksa.

Bilang ang mga kalahok ay na sa ika anim na baitang makikita rin sa talahanayan 2 ang paggamit ng internet at aklat, di na linggid sa ating kaalaman na madalas na gamitin ng mga mag-aaral ang internet maging ang mga aklat. Dito dalawa na ang maari nilang gamitin upang makakuha ng impormasyon patungkol sa makabagong ideya

tulad sa nabanggit ng isa sa mga kalahok;

“I use the internet to make the lesson easier to understand and use books for more details.”-
kalahok 8-

Ang paggamit ng internet at mga aklat ay isa sa mga mahalaga upang magkaroon ng ideya ang mga mag-aaral. Ito ang ginagamit ng karamihan sa mga mag-aaral na siyang tumutulong sa pagkatuto at kaagapay sa kanilang pag-aaral. Nabanggit sa pag-aaral nina Umrah et al, (2025), na ginagamit ng mga estudyante ang social media platform tulad ng Google, Youtube, Facebook at Tiktok upang mapahusay ang kanilang wikang Ingles, kabilang ang pagsasalita at bokabularyo at madagdagan ang kanilang paunang kalaman sa nasabing paksa na kanilang pinag-aaralan.

Makikita rin sa talahanayan 2 na natututo ang mga mag-aaral kapag nakikilahok at sumasali ang mga mag-aaral sa mga gawaing ibinibigay ng guro. Ito ang nagsisilbing paraan ng mga mag-aaral upang madaling matutunan ang isang paksa o aralin, nabanggit ng isa sa mga kalahok na;

*“Para maintindihan ko ang lesson, sumasagot ako ng quiz at sumasali sa mga activity sa klase. Nakatutulong ito para masanay ako.”-*kalahok 3-

Ang pakikilahok sa mga gawain ay isa sa mga mahalagang paraan upang matuto ng ispisipikong paksa maging sa isang asignatura. Dahil ang pagsali sa mga gawain ay hindi lamang ang kognitibong kalaman ang nahahasa bagkos pati ang karanasang makukuha sa mga gawaing ibinibigay. Nabanggit ni Lev Vygotsky na mahalaga ang interaksyon sa pagkatuto dahil dito nabubuo ang mas malalim nap ag-unawa sa konsepto. Kapag aktibong nakikilahok ang mag-aaral sa talakayan, natututo itong magsuri, magpaliwanag, at magbigay ng sariling opinyon.

Kasama rin sa talahanayan 2 ang paraan ng pagkatuto ay sa tulong ng guro. Mas madaling natututunan ng mga mag-aaral ang paksa sa asignaturang Filipino kapag ang guro ay may nakahandang halimbawa tulad sa nabanggit ng isang kalahok,

“Mas naiintindihan ko kapag may example si teacher at kapag nagkakaroon ng group work”-
kalahok 2-

Ang mga halimbawang ibinibigay ng guro ay isa sa mga paraan ng mg mag-aaral upang madaling maunawaan ang paksang tinatalakay sa asignaturang Filipino. Sa inilathala ni Lopez (2018), ang pagbibigay ng halimbawa sa pagtuturo ay kritikal upang gawing kongkreto, malinaw, at madaling maunawaan ang abstraktong konsepto. Ito ay nag-uugnay sa teorya at totoo buhay, nagpapataas ng motibasyon, at tumutulong sa mga mag-aaral na magamit ito sa tunay na buhay.

Mga Mungkahi sa Pagkatuto - Makikita sa talahanayang ito ang mga mungkahing ibinahagi ng mga kalahok para sa pagpapabuti ng pagkatuto sa asignaturang Filipino.

Talahanayan 3. Mga Mungkahi sa pagkatuto

Mga Mungkahi	Mga Tugon	Pagpapakahulugan
Pagbabasa ng mga Aklat	“To improve learning, I suggest that we should read more books, and use digital tools for practice.” - Kalahok 1	Kinakailanagang magbasa ng marami pang aklat o mga babasahin ng sa ganon ay mas madagdagan at magkaroon ng panibagong ideya para sa paksa sa asignaturang Filipino. Ang pagbabasa ng aklat o iba pang babasahin ay naktutulong sa pagkatuto ng mga mag-aaral.
	“Magbasa pa kami ng maraming books” - Kalahok 5	
	“Para gumaling, dapat magbasa pa kami ng mga aklat at sa internet.” - Kalahok 7	

Mga akademikong laro	“To have more games about the topics, mas nageenjoy at natututo kapag parang games.” - Kalahok 2	Ang mga laro na konektado sa aralin ay isa sa mga suhestyon ng mga mag-aaral upang mas maging madali sa kanila ang pagkatuto sa asignaturang Filipino. Ang nasabing laro ay ang hindi nakaugaliang laro kundi ang mga makabong laro na ginagamit ng mga guro sa pagtuturo sa kanilang mga mag-aaral.
	“I suggest having games that can help us learn more words, not only about the lesson.” - Kalahok 4	
	“We should also have games to learn more words.” - Kalahok 8	
Mga Dula-dulaan	“Role Playing and fun activities can help us improve our vocabulary.” - Kalahok 8	Ang dula-dulaan ay isa rin sa mga naging mungkahi ng mga kalahok sa pagpapadali ng pagkatuto sa asignaturang Filipino. Ito ang nagsisilbing tulay ng mga mag-aaral sa kanilang pagkatuto gaya ng pag-aaral sa mga akdang pampanitikan.
	“Need din ng roleplay activity at story telling para sa Filipino.” - Kalahok 2	
Mas maraming gawain at pagsasanay	“Sana magbigay pa ng mas maraming practice sa pagsasalita.” - Kalahok 3	Ang pagdaragdag ng mga gawain ay iminungkahi rin ng mga mag-aaral ng sa gayon ay mahasa ang kanilang kaalaman at magkaroon ng panibagong kaalaman sa paksang tinatalakay ng guro at ang paksang nais pag-aralan.
	“Magkaroon ng maraming activities specially sa buwan ng wika.” - Kalahok 2	

Makikita sa talahanayan 3 na ang mga iminungkahing paraan ng mga kalahok ay ang pagbabasa ng mga aklat at mga babasahin upang maragdagan ang kanilang pagkatuto, tulad sa nabanggit ng isa sa mga kalahok;

“Para gumaling, dapat magbasa pa kami ng mga aklat at sa internet.”-kalahok 7-

Ang pagbabasa ay lubos na nagpapalawak ng kaalaman, dito nadaragdagan ang kaalaman mula sa tekstong nababasa, ang pagbabasa ay nakabubuti para sa isip ng mga mag-aaral upang makakuha ng panibagong impormasyon at makasalubong ng mga bagong salita na magagamit sa pag-aaral. Sa inilathala ni Regal (2026), Mahalaga ang pagbasa sa buhay nga bawat tao sapagkat ito ang nagsisilbing pangunahing kasangkapan sa pagtuklas ng karunungan, kung baga ito ang gintong susi na magbubukas ng pinto sa daigdig ng karunungan at kasiyahan. Maliban sa pagbabasa ng aklat makikita rin sa talahanayan 3 ang mga akademikong laro. Ang mga laro ay may kilaman sa paksang tinatalakay ng mga guro na nagsisilbing paraan ng mga mag-aaral upang madaling matutunan, katulad sa nabanggit ng isa sa mga kalahok;

“I suggest having games that can help us learn more words, not only about the lesson.”-kalahok 4-

Ang mga larong ito ay nagsisilbing alternatibong paraan ng mga guro sa pagtuturo na kung saan nagkukuha ng mga mag-aaral ang pagkagalak na matutunan ang paksa upang makasali at magtagumpay o manalo sa ibinigay na laro ng guro. Ayon kay Balisacan (2025), ginagamit ang *gamification* ang mga likas na hangarin ng mga tao para sa katayuan, tagumpay, pagpapahayag ng sarili at kumpetisyon upang mag-udyok sa pag-aaral. Ang mga element ng laro ay nagbibigay ng agarang puna upang masubaybayan ng mga mag-aaral ang kanilang sariling pag-unlad at maramdaman ng isang pakiramdam ng tagumpay. Makikita sa inilata na inagamit ang mga laro upang ng sa ganun ay mas mapadali ang pagkatuto.

Makikita rin sa talahanayan 3 at isa sa mga mungkahi ng mga kalahok ang pagbibigay ng mga gawain tulad ng dula-dulaan. Ang dula-dulaan ang nagsisilbing makatotohanang pagpapakita ng mga kaganapang nangyari sa isang akdang pampanitikan na pinag-aaralan ng mga mag-aaral. Ito ang nagbibigay ng malawak na ideya sa mga mag-aaral na nag-aaral ng isang akda, katulad sa nabanggit ng isa sa mga kalahok;

“Need din ng roleplay activity at story telling para sa Filipino.”-kalahok 2-

Nagsisilbing salamin ng isang akdang pampanitikan ang pagsasagawa ng dula-dulaan ng mga mag-aaral, sa pamamagitan nito mas pinapatalas ang kaisipan ng mga mag-aaral tungkol sa mga nilalaman ng isang akda, sa tulong nito mas napapalawak ang imahenasyon na sinabayan ng pagmomorya sa bawat linyang makikita sa isang akda. Sa inilathala ni Calpo (2026), ayon sa pag-aaral sa larangan ng edukasyong pangkultura at sining, ang paggamit ng drama o dula sa klase ay napapalalim ng pag-unawa ng mga mag-aaral dahil nagiging mas interaktibo at makabuluhan ang pagkatuto. Dagdag pa rito, pinapaunlad nito ang kritikal na pag-iisip at empatiya dahil naisasabuhay ng mga mag-aaral ang iba't ibang sitwasyon at perspektibo. Nabanggit sa inilathala na importante talaga sa pagkatuto ang pagsasabuhay ng isang pangyayari upang makuha ang mga detalye batay mismo sa pagka-unawa ng mga mag-aaral.

At, ang huling hinuha na makikita sa talahanayan 3 ay ang maraming gawain, ang mga gawain ang nagsisilbing pagsasanay sa pagpapatibay o pagpapatatag ng kaisipan ng mga mag-aaral sa isang paksa katulad nalamang sa asignaturang Filipino. Iginiit ng isa sa mga kalahok na kaialangan din na magkaroon ng marami at iba't ibang gawain sa pagkatuto tulad sa nabanggit ng isa sa mga kalahok;

“Magkaroon ng maraming activities specially sa buwan ng wika.”-kalahok 2-

Ang pagbibigay ng maraming gawain ay isang paraan upang mapatalas ang mga kaalaman at kaisipan ng mga mag-aaral sa isang paksa, ang pagsasanay sa mga mag-aaral ng maraming gawain ang nagiging tulay upang masanay ang kanilang pag-iisip sa maramihang impormasyon nakakalap na magpapatibay sa kanilang kaalaman. Nabanggit rin sa pag-aaral ni Salazar (2025), na mahalaga ang tuloy-tuloy na pagsasanay upang malinang ang bokabularyo, gramatika, at kasanayan sa komunikasyon. Ipinakita rin na ang kakulangan sa pagsasanay ay nagdudulot ng mabagal na pagkatuto at hirap sa paggamit ng kaalaman sa tunay na sitwasyon. Dahil makikita sa kanilang pagsasanay na isa sa mga tema ang kakulangan ng pagsasanay ang siyang dahilan ng pababa ng kakayahan sa paggawa ng mga mag-aaral.

4. Konklusyon at rekomendasyon

Konklusyon - Batay sa natuklasan na resulta sa pagsusuri ang mananaliksik ay nakabuo ng sumusunod na konklusyon:

- Kabilang sa mga hamon na kinakaharap ng mga mag-aaral ang mahirap na matandaan ang kahulugan ng mga salita sa Filipino, paggamit ng malalim na salita sa pagtuturo, bilis ng pagtatalakay, at nahihirapan sa pagsasalita ng Filipino. Makikita rin dito ang epekto ng mga hamon tulad ng pagbaba ng marka, kawalan ng kompyansa sa sarili, nahihirapan sa pagsagot sa recitation.
- Habang ang paraan ng pagkatuto naman ay kinabibilangan ng pagninilay at pagtatanong sa sarili, pagtatala ng mga bagong salita, paggamit ng internet at aklat, pagsali sa mga gawain at pagbibigay ng mga halimbawa ng guro.
- At, naging mungkahi naman ng mga kalahok para sa pagkatuto sa asignaturang Filipino ay ang pagbabasa ng mga aklat, mga akademikong laro, pagsasagawa ng mga dula-dulaan, at mas maraming gawain at pagsasanay.

Rekomendasyon

- Inererekominda sa susunod na mananaliksik na palawakin pa ang pagsusuri tungkol sa mga hamon ng mga mag-aaral na nahihirapan sa pagkatuto sa asignaturang Filipino. Gayun din masulusunang ang mga epekto nito.
- Iminungkahi rin na bigyang ideya ang mga mag-aaral ng mga panibagong ideya sa pagkatuto ng asignaturang Filipino.
- At, pakinggan ang mga iminungkahi ng mga mag-aaral para sa mas madaling pagkatuto ng asignaturang

Filipino.

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Pagpapahalagang moral: Pagsusuri sa Akdang Impeng Negro ni Rogelio Sicat

Suñer, Justine May L. ✉

Leyte Normal University, Philippines (sunerjustinemay16@gmail.com)

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Abstract

This study aims to examine the moral values embedded in the literary work Impeng Negro by Rogelio Sicat. Specifically, it identifies the moral values reflected in the plot, main character, and the lessons that may be derived from the story. The study employs a qualitative research design through Content Analysis and Thematic Analysis as the primary methods in analyzing the literature. It is also anchored on the Moralistic and Sociological Theories to better understand the relationship between morality and the social context embodied in the literary work. This study is expected to contribute to a deeper understanding of literature as a reflection of society and as a medium for conveying significant lessons that may help shape the moral consciousness of readers.

Keywords: discrimination, Impeng Negro, morality, moral values, reflection of society

Pagpapahalagang moral: Pagsusuri sa Akdang Impeng Negro ni Rogelio Sicat

1. Abstrak

Ang pag-aaral na ito ay naglalayong suriin ang mga pagpapahalagang moral na nakapaloob sa akdang *Impeng Negro* ni Rogelio Sicat. Tinutukoy nito ang mga pagpapahalagang moral na masasalamang sa banghay, pangunahing tauhan, at mga aral na maaaring makuha mula sa akda. Ginagamit sa pag-aaral ang disenyong kwalitatibong pananaliksik sa pamamagitan ng *Content Analysis* at *Thematic Analysis* bilang pangunahing pamamaraan sa pagsusuri ng teksto. Nakabatay rin ito sa Teoryang Moralistiko at Sosyolohikal upang maunawaan ang ugnayan ng moralidad at kontekstong panlipunan na nakapaloob sa akda. Inaasahang makatutulong ang pag-aaral na ito sa pagpapalalim ng pag-unawa sa panitikan bilang salamin ng lipunan at daluyan ng mahahalagang aral na maaaring magamit sa paghubog ng kamalayang moral ng mga mambabasa.

Susing salita: diskriminasyon, Impeng Negro, moralidad, pagpapahalagang moral, salamin ng lipunan

2. Introduksyon

Ang bawat Pilipino ay kilala sa mundo sa pagiging mabait at masayahing tao. Marami sa mga Pilipino ay may malawak na kamalayan sa tungkol sa prensipyo o kagandahang-asal na nagsisilbing gabay upang malaman ang pagkakaiba ng tama sa mali. Higit na may malawak na pag-unawa sa kapwa, ngunit ganun paman ay mayroon pa rin itong hangganan, na nagiging sanhi ng pagkakaroon ng ideyang makapanakit sa ibang tao dahil sa bugso ng damdamin. Isa rin sa mga katangian ng mga mga Pilipino ang hindi pagpapalupig sa mga nang-aabuso o nang-aapi sa mga ito, ganumpaman mahalaga pa rin sa mga Pilipino ang sinasabing pagpapahalagang moral na kung saan mas pinapairal nito ang mga gawaing makabubuti tulad ng pagaaral ni Amora (2020), na ang pagpapahalagang moral ay ang pagkakaroon ng positibong pananaw sa buhay sa kabila ng mga suliraning kinahaharap. Hindi dapat mawalan ng pag-asa sa buhay, at nasa ating kultura ang maging maparaan sa paghahanap ng kalutasan sa bawat problemang pinagdadaanan. Taliwas sa akdang Impeng Negro na kung saan ang pangunahing tauhan ay mas piniling gumamit ng karahasan upang makuha ang hustisya dahil sa patuloy na pang-aapi ng isa sa mga tauhan ng nasabing akda ni Rogelio Sicat.

Marami sa mga Pilipino ang pinipili ang huwag pumatol sa mga nang-aapi o nanunukso sa mga ito. Pinipili nilang manahimik nalamang ng sa ganun ay hindi na lumaki ang hidwaan ng parehong panig. Ilan sa mga dahilan na kung saan nawawalan ng kontrol sa sarili ang mga inaapi, dahil sa patuloy na pagmamalabis sa mga ito. Hindi na ito bago sa ating mga Pilipino dahil ang ating mga ninuno na nakibaka upang patalsikin ang mga mananakop ay gumamit na rin ng karahasan upang maipagtanggol ang sariling pamilya maging ang ating inang bayan laban sa mga dayuhan, ayon pa ng kay Galdiano (2025), ang rason ng pakikibaka ng mga Pilipino ay nag-ugat sa hindi makatarungang kondisyon, na naging dahilan sa mga mamamayan na ipaglaban ang kanilang karapatan at kabuhayan. Ang pag-aaral na ito ay naglalayong malaman ang mga pagpapahalagang moral mula sa akdang Impeng Negro ni Rogelio Sicat, ang mga naunang pag-aaral at literature ay magsisilbing gabay sa kasalukuyang pananaliksik.

Layunin - Layunin ng pananaliksik na ito na malaman ang pagpapahalagang moral na nakapaloob sa akda, sa pangunahing tauhan at makuha ang mga aral na nakapaloob sa adang Impeng Negro ni Rogelio Sicat. Ang mga katanungan ang magsisilbing gabay na layunin:

- Ano-ano ang mga pagpapahalagang moral ang nakapaloob sa kwentong Impeng Negro?
- Ano-anong mga katangian ng mga pangunahing tauhan na nagtataglay ng mga pagpapahalagang moral?
- Anong aral ang mga nakapaloob sa akdang Impeng Negro ni Rogelio Sicat na nangingibabaw ang

pagpapahalagang moral?

Saligang Teoritikal - Ang pag-aaral na ito ay nakabatay sa Teoryang Moralistiko at Teoryang Sosyolohikal, na kapwa nagbibigay-diin sa pagsusuri ng mga pagpapahalagang moral at ugnayan ng indibidwal sa lipunan. Teoryang Moralismo. Ayon sa teoryang ito, mahalagang suriin ang akdang pampanitikan batay sa mga aral at pagpapahalagang moral na taglay nito, sa inilathala ng Lampung University (2024), mahalaga ang pagtukoy sa at pag-unawa sa mga moral na aral na ipinapahayag ng mga akda. Pinag-aaralan kung paano nilalarawan ng mga manunulat ang mga katanungang pang-etika at kung paano ito nakaapekto sa mga karakter at plot ng kwento. Karanaiwang isinasalin ang mga aral na ito sa mga pang-araw-araw na karanasan at pagpapasiya ng tao sa tunay na buhay. Sa kwentong Impeng Negro, masasalamang ang mga pagpapahalagang tulad ng pagtitiis, katatagan ng loob, at paggalang sa sarili sa kabila ng diskriminasyon. Ginagamit ang teoryang ito upang matukoy kung paano naipapakita ng mga tauhan ang tama at mali, at kung paano hinuhubog ng kanilang karanasan ang kanilang pagkatao.

Teoryang Sosyolohikal. Binibigyang-pansin ng teoryang ito ang relasyon ng panitikan sa lipunan. Sa akda, makikita ang isyu ng diskriminasyon, kahirapan, at hindi pantay na pagtingin sa kapwa. Sa pamamagitan nito, mas nauunawaan ang kalagayan ng pangunahing tauhan sa konteksto ng kanyang kapaligiran at kung paano nakaapekto ang lipunan sa kanyang pag-uugali at pagpapasya. Ang teoryang sosyolohikal naman ay may layuning ipakita ang kalagayan at suliraning kinakaharap ng lipunang kinabibilangan ng may akda. Ipinakikita rito ang mga pamaraan o kaparaanan sa pagsugpo o paglutas sa mga nasabing suliranin. Isang halimbawa ay ang ginawang pagsusuri sa kantang “Magdalena” ni Movilla (2018), layuning maipakita ang suliranin at kalagayang panlipunan na kinabibilangan ng may-akda, sa awiting “Magdalena”, nais iparating ng manunulat na isa ang kahirapan sa mga sakit ng lipunan na tila hindi mabigyang lunas.

Masisilbing gabay ang mga teoryang ito sa pagsusuri ng akda ng mananaliksik patunkol sa pagpapahalagang moral na nakapaloob sa kwento, katangiang may kilaman sa pagpapahalagang moral ng pangunahing tauhan ito ay konektado sa teoryang moralistiko. Habang ang teoryang sosyolohikal naman ay naka pokus sa suliraning nakapaloob akda na diskriminasyon upang makuha ang mga hinuha, emosyon at impresyon ng mga mag-aaral sa akdang binasa na maikokonekta sa lipunang ginagalawan mismo ng mambabasa.

Saklaw ng Pag-aaral - Ang pag-aaral na ito ay nakapokus lamang sa piling akda ni Rogelio Sicat na pinamagatang Impeng Negro at nakapokus sa pagpapahalagang moral at mga nakapaloob na katangian sa pagpapahalagang moral sa pangunahing tauhan. Gayundin ang mga aral na makukuha o nakapaloob sa kwento na may koneksyon sa pagpapahalagang moral sa kwentong Impeng Negro. Gayundin, nakatuon lamang ito sa nabanggit na akda at hindi isinasaalang-alang ang iba pang akdang pampanitikan.

3. Metodolohiya

Ang pag-aaral na ito ay gumamit ng disenyong kwalitatibong pananaliksik sa pamamagitan ng pamamaraang *Content Analysis*. Ang *Content Analysis* ay isang sistematikong pagsusuri sa nilalaman ng mga tekstong nakasulat o berbal upang matukoy ang mga tema, kahulugan, at padron na nakapaloob dito. Ayon kay Gustafson (1984), ang pamamaraang ito ay epektibong ginagamit sa pagsusuri ng iba’t ibang anyo ng midya gaya ng panitikan, pelikula, kanta, at iba pang komunikatibong materyales. Angkop ang disenyong ito sa kasalukuyang pag-aaral sapagkat layunin nitong suriin ang mga pagpapahalagang moral na makikita sa akdang *Impeng Negro*, partikular sa banghay, tema, at paghubog sa pangunahing tauhan.

Isinagawa ang pag-aaral gamit ang akdang *Impeng Negro* ni Rogelio Sicat na unang nalathala noong 1963 at nagkamit ng parangal sa Carlos Palanca Memorial Awards for Literature. Ang akda ay tumatalakay sa isyu ng diskriminasyon at pakikibaka ng isang indibidwal laban sa mapanghusgang lipunan. Pinili ang akdang ito dahil sa patuloy na pag-iral ng diskriminasyon at kakulangan sa pagpapahalagang moral sa kasalukuyang lipunan, kaya’t mahalagang suriin ang mga aral at pagpapahalagang maaaring makuha rito. Sa pamamagitan ng tekstong ito, nabibigyang-diin ang ugnayan ng panitikan at realidad ng lipunan.

Sa pangangalap ng datos, sinunod ng mananaliksik ang ilang hakbang. Una, nagsagawa ng masusing pagbasa at pagsusuri sa akdang napili upang maunawaan ang kabuuang konteksto nito. Ikalawa, tinukoy at pinili ang mga bahagi ng akda na nagpapakita ng mahahalagang pagpapahalagang moral. Ikatlo, isinagawa ang *thematic analysis* upang matukoy ang mga pangunahing tema kaugnay ng moralidad, karakter ng pangunahing tauhan, at mga aral na maaaring mapulot. Sa huli, inayos at binigyang-interpretasyon ang mga nakalap na datos upang makabuo ng makabuluhang pagsusuri na tumutugon sa layunin ng pag-aaral.

4. Resulta ng Pag-aaral

Nakapaloob sa bahaging ito ang naging resulta ng isinagawang pagsusuri sa mga peling kwento ni Rogelio Sicat na pinamagatang Impeng Negro. Makikita ang mga linya na kakikitaan ng pagpapahalagang moral.

4.1 Mga Pagpapahalagang moral sa Kwento

Talahanayan 1

Mga Pagpapahalagang Moral

Mga Katangiang Moral	Taludtod sa Kwento	Pagpapakahulugan
Paggalang	<i>"Hindi ho," paungol niyang tugon.</i> <i>"Hindi ho..." Ginagad siya ng kanyang ina. "Bayaan mo na nga sila. Kung papansinin mo'y lagi ka ngang mababasag-ulo."</i>	Ang mga batang Pilipino ay tunay na nagbibigay respeto sa kanilang mga magulang, ang pagsunod sa kanilang mga magagandang payo ay siyang nagpapabuti sa mga kabataan at ang pagkakaroon ng respeto sa kapwa maging sa sarili.
Disiplina sa Sarili	<i>"Mabuti na rin iyon kahit nakabilad sa araw. Pasasaan ba't di iikli rin ang pila nasaisip niya. Makakasahod din ako."</i>	Ang pag-iwas sa gulo ay isa sa mahalagang parte sa pakikipagkapwa, nakikita ang pag didisiplina sa sarili at ang pagkakaroon ng mapayapang kaisipan. Nagiging payapa ang sarili at kapaligiran kung iiwasan ang pagkakaroon ng gulo.
Pagpapakumbaba	<i>"Si Ogor, Impen," pahabol na bilin ng kanyang ina. "Huwag mo nang pansinin."</i>	Ang hindi pagpatol sa mga taong gustong makipag-away ay hindi ibig-sabihin ay karuwagan bagkos ito ay sinasabing pagpapakumbaba. Na nagbibigay kapayapaan sa sarili maging sa buong lipunang ginagalawan.
Katapangan	<i>"Kasalukuyan siyang nagtitiis sa init nang may maulinigan siyang sigaw mula sa tindahan"</i> <i>"O...gor ... O ...gor" Nakatingala siya kay Ogor, mahigpit na kinukuyom ang mga palad. Kumikinig ang kanyang ulo at nangangalit ang kanyang ngipin. "Ogor!" sa wakas ay naisigaw niya"</i> <i>"Kumikinig ang kanyang katawan. Sa poot. Sa naglalatang na poot. At nang makita niyang aangat ang kanang paa ni Ogor upang sipain siyang muli ay tila nauulol na asong sinunggaban niya iyon at niyakap at kinagat."</i>	Ang katapangan ay hindi lamang nagipakikita sa marahas na paraan. Minsan ito ay sapilitang pinapalabas, sa pamamagitan ng labis na pagmamalabis ng tao sa kapwa tao. Ang Katapangan ay itinatago na kung saan kusang lumalabas kung ang isang tao ay nakararanas ng hindi patas na pakikisalamuha.
Katarungan	<i>"Sa matinding sikat ng araw. Tila siya isang mandirigmang sugatan ngunit matatag na nakatindig sa pinagwagiang larangan."</i> <i>"May luha siya sa mga mata ngunit may galak siyang nadama. Luwalhati. Hinagud-hagud niya ang mga kamao. Nadama niya ang bagong tuklas na lakas niyon. Ang tibay, ang tatag... ang kapangyarihan. Muli niyang tiningnan ang nakabulagatang si Ogor. Pagkaraa'y nakapikit at buka ang labing nag-angat siya ng mukha."</i>	Ang pagkamit ng katarungan ay minsan kinakailangang gumamit ng dahas upang makuha ito. Kinakailangan pang magakroon ng hindi magandang paraan upang makuha ang nararapat na hustisya para sa gusto makamit ang katarungan na ninanais ng isang taong patas na lumalaban upang

Makikita sa talahanayan 1 na ang mga nakapaloob na pagpapahalagang moral sa kwentong Impeng Negro ay ang Paggalang, Disiplina sa Sarili, Pagpapakumbaba, Katapangan, at Katarungan.

Ang paggalang ay isa sa mga pinakamahalagang elemento sa pakikipagkapwa tao, ang taong magalang ay nasusuklian din ng paggalang mula sa ibang tao, maaring paggalang sa kaibigan, tao sa lipunan at lalo na ang paggalang sa pamilya katulad sa isang bahagi ng kwento;

“Hindi ho...” Ginagad siya ng kanyang ina. “Bayaan mo na nga sila. Kung papansinin mo’y lagi ka ngang mababasag-ulo.” - Impeng

Ang paggalang ay nakabubuti sa kahit na sinong tao kapag marunong kang gumalang ikaw rin ay masusuklian nito. Sa inilathala ni Ki (2021), sinasabi na ang paggalang sa mga matatanda o mga taong mas matanda sa amin ay isang halimbawa ng mahusay na pag-uugali na hindi maiiwan sa aming mga puso at isipan, hindi alintana kung nasaan ka sa mundo o kung anong kultura ka kabilang. Makikita na hindi lamang ang mananaliksik ang nagsasabi na mahalaga sa lipunan ang pagkakaroon ng paggalang sa bawat isa.

Makikita rin sa talahanayan 1 ang pagpapahalagang moral na disiplina sa sarili. Ang pagagakroon ng disiplina sa saril ay mahalaga sa bawat taong naninirahan sa isang lipunan, ito ay makatutulong upang mapabuti ang lahat katulad sa nabanggit sa kwento

“Mabuti na rin iyon kahit nakabilad sa araw. Pasasaan ba’t di iikli rin ang pila nasaisip niya. Makakasahod din ako.” - Impeng

Ang disiplina sa sarili ay napaka importante sa bawat tao. Kinakailangan na sinusunod ito ng sag anon magkaroon ng magandang epekto para sa sarili at para sa ibang tao. Nabanggit ni Cabellon (2025), na ang pagdisiplina sa sarili ay mas mahirap pa kaysa sa pagdidisiplina ng mga magulang. Ang pagkakaroon ng disiplina sa sarili ay nagtutulak sa pagplaplano ng mga aksyon at pag-iwas sa mga distraksyon. Mahalaga ito upang makamit ang mga layunin sa buhay na makabubuti hindi lamang para sa sarili kundi pati na rin sa iba. Tunay ngang mahalag ang pagkakaroon ng disiplina sa sarili dahil pa nga sa sinabi ni Cabellon na ito ay mas mahirap pa kaysa sa pagdidisiplina sa ng mga magulang sa kanilang mga anak.

Nakapaloob rin dito sa talahanayan 1 ang pagpapakumbaba, ang pagpapakumbaba ay mabuti sa disiplinang sosyal dahil ang pagpapakumbaba sa kapwa o sa lahat ng naksasalimuha ay nagpapaigting ng respeto sa kapwa sa loob ng iisang komunidad katulad sa nabanggit sa isang bahagi ng kwento.

“Si Ogor, Impen,” pahabol na bilin ng kanyang ina. “Huwa mo nang pansinin.” - Ina ni Impeng

Ang pagpapakumbaba ay mahalaga upang hindi na lumaki pa ang gusot na kinakaharap ng isang tao upang hindi humanton sa alitan mas mabuting magpakumbaba na lamang. Ito ay mahalaga at ibinilin ng diyos sa buong san libutan. Nabanggit sa inilathalang kaalaman ni Teejay (2026), na ang pagpapakumbaba ay mahalaga upang makasunod sa kalooban ng Diyos at makamit ang mga biyaya at kapayapaan mula sa kanya. Ang pagiging mapagkumbaba ay nagsusulong ng karunungan, pagkakaisa, at esperitwal na paglago. Makikita sa inilathala na mahalaga ang pagpapakumbaba ng sa gayon ay maging mabuti ang ugnayan ng bawat isa sa isang lipunan.

Ang katapangan ay kabilang rin sa mga pagpapahalagang moral na makikita sa talahanayan 1. Ang Katapangan ay isa lamang bahagi ng pagkatao na kung saan maaring magkaroon ng masama o mabuting epekto para sa sarili at maging sa ibang tao. Tulad sa isang linyang ito makikita sa kwento:

“O...gor ... O ...gor” Nakatingala siya kay Ogor, mahigpit na kinukuyom ang mga palad. Kumikinig ang kanyang ulo at nangangalit ang kanyang ngipin. “Ogor!” sa wakas ay naisigaw niya.” - Impeng

Makikita sa linyang ito ang paglabas ng katapangan ni Impeng, ngunit di ipagkakaila na hindi maganda ang

pakikipag away at paggamit ng katapangan sa karahasan. Ngunit ang katapangang ipinakita sa kwento ay ang katapangang makatutulong sa sarili, sa inilathala ng Monson (2014), na kabilang din sa katapangan ng kalooban ang paggawa ng tama kahit natatakot, pagtatanggol sa paniniwala kahit pa mawala ang mga kaibigan o katayuan sa lipunan. Batay sa inilathala na kaparte ng kaisipan ng tao ang katapangan na kung saan kinkailanagang mag desisyon ng mabuti.

Sa huli, makikita rin sa talahanayan 1 ang katarungan, katarungang nagpapahimlay ng kalooba sa isang taong inapi at tinutukso. Ang katarungang gustong makuha ng mga taong minsan ay inapi at nakuha ang katarungan sa isang paraan. Katulad sa ginawa ni Impeng sa kwento;

“Sa matinding sikat ng araw. Tila siya isang mandirigmang sugatan ngunit matatag na nakatindig sa pinagwagiang larangan.” - Tagapagsalaysay

Ang pagkamit ng katarungan ay hindi madali ngunit kapag ito ay nakamit ay nagkakaroon ng kaginhawaan sa loob ng katawan na parang isang magiting na mandirigma na nagkaroon ng pagkakataon mapatumba ang kalaban. Dahil ayon pa kay ni Jade (2025), na ang katarungan ay tumutukoy sa prinsipyo ng pagbibigay ng pantay na pagtrato sa mga gawain tulad ng mga oportunidad at mga kagamitan. Ito ay nagsusulong ng pantay na pagtrato sa lahat anuman ang katayuan. Batay kay Jade na dapat pantay ang pagtrato sa bawat isa ng sag anon ay magakaroon ng kaayusan at hindi magkagulo sa isang lipunan. Ayon din sa inilathala na ang lipunan ay kailangang mayroon pantay at patas na katarungan.

4.2 Mga Katangiang Moral Ng Pangunahing Karakter

Talahanayan 2

Katangian Moral

Mga Katangiang Moral	Taludtod sa Kwento	Pagpapakahulugan
Magalang sa magulang	<i>“Hindi ho...” Ginagad siya ng kanyang ina. “Bayaan mo na nga sila. Kung papansinin mo’y lagi ka ngang mababasag-ulo.”</i> <i>-Impeng-</i>	Si Impeng ay isang batang magalang, siya ang may respeto sa kanyang mga magulang na makikita sa kwento ang patuloy na pagsunod nito sa mga bilin at utos ng kanyang ina. Makikita sa karakter ni Impeng ang isang magalang na bata.
May Disiplina sa Sarili	<i>“Mabuti na rin iyon kahit nakabilad sa araw. Pasasaan ba’t di iikli rin ang pila naisaisip niya. Makakasahod din ako.”</i> <i>-Impeng-</i>	Si Impeng ay isang batang may disiplina sa sarili, alam niyang mayroong magyayari kung siya ay pumunta kina Ogor. Makikita dito ang disiplina ni Imoeng na umiwas sa gulo.
Matapang	<i>“Kasalukuyan siyang nagtitiis sa init nang may maulinigan siyang sigaw mula sa tindahan”</i> <i>-Impeng-</i>	Si Impeng ay isang matapang na bata, buo ang loob na umiwas sa gulo matapang niyang hinaharap ang mga sulraning bigay ni Ogor sa kanyang sarili. Makikita sa kwento na ang katapanagn ni Impeng ay hindi lamang siya gumagamit ng pisikal na pamamaraan ngunit ang katapangan sa loob ng kanyang damdamin at talas ng pag-iisip.

Makikita sa talahanayan 2 na ang kataniang tintaglay ni Impeng ay ang pagiging magalang, may disiplina sa sarili, at matapang.

Magalang sa Magulang. ng pagiging magalang sa magulan ay isa sa pinakaunang katangian na dapat taglayin ng isang bata. Bilang respeto sa magulang ay kinakailangan suklian ng paggalang sa lahat ng oras at sa kahit na anumang bagay. Ang pagsasalita ng magaganda katulad ng “Po at Opo” ay labis na ikabubuti sa damdamin ng mga magulang. Ayon pa kay Matuan (2025), na mahalaga ang paggamit ng “po” at “opo” dahil nagpapakita ito ng paggalang sa nakatatanda at sa kausap, nagpapanatili ng kulturang Pilipino, nagpapabuti ng ugnayan sa pakikipag-

usap, at humuhubog sa mabuting asal ng bawat isa. Tunay ngang mahalaga ang pagsasalita ng magaganda katulad ng “po at opo” dahil ito ay nagpapakita ng pagalang sa magulang maging sa lahat ng taon nakasasalamuha sa lipunang ginagalawan. Makikita dito na ang karakter ni Impeng ay may mataas na paggalang sa kaniyang magulang at patuloy itong sinusunod sa araw-araw.

May Disiplina sa Sarili. Ang pagakakaroong ng disiplina sa sarili ay maalaga sa buhay ng isang tao. Ito ang tumutulong upang maging maayos at may patutunguhang ang mga desisyon sa buhay. Ang pagkakaroon ng disiplina sa sarili ay mahalaga sapagkat ito ang nagpapatibay sa ugnayan ng bawat isa sa isang lipunan. Nabanggit ni Cabellon (2025), na ang pagdisiplina sa sarili ay mas mahirap pa kaysa sa pagdidisiplina ng mga magulang. Ang pagkakaroon ng disiplina sa sarili ay nagtutulak sa pagplaplano ng mga aksyon at pag-iwas sa mga distraksyon. Mahalaga ito upang makamit ang mga layunin sa buhay na makabubuti hindi lamang para sa sarili kundi pati na rin sa iba. Makikita sa inilathala ni Cabellon na talagang mas mahirap ang pagdidisiplina sa sarili kaysa sa pagdidisiplina ng mga magulang sa kanilang mga anak, dahil dito makikitang si Impeng ay nagtataglay ng ganitong katangian na siyang ginagamit nito sa araw-araw niyang pamumuhay sa kabila ng patuloy na pangungutya ni Ogor.

Matapang. Ang katapangan ay likas na dala ng tao. Ito ay isang katangian ng pagkakaroon ng lakas ng loob na malampasan ang nakaambang problema, makikita dito ang didikasyon malampasan ang mga balakid sa buhay. Ngunit minsan nagagamit ang katapangan upang maipagtanggol ang sarili sa mga taong may masamang hangarin. Sa kabilang banda may magandang naidudulot naman nito sa buhay tulad sa paggamit ng katapangan upang maging matagumpay sa buhay. Sa inilatha ng Far Eastern University (2016), Ang katapangan ay isa sa mga pinakamahalagang sangkap tungo sa tagumpay. Hindi lamang ito tumutukoy sa pisikal na lakas, kundi higit sa lahat, sa tatag ng loob na harapin ang mga hamon ng buhay. Makikita ang ganitong katangian sa karakter ni Impeng na may lakas ng loob na makipagsapalaran sa buhay sa gitna ng pang-aabuso ni Ogor. Matapang nitong hinarap ang mga problemang naka-amba sa kanyang buhay katulad sa pagmamalabis at pang-aabuso.

4.3 Mga Aral na Nangibabaw sa Kwento

Talahanayan 3

Mga Aral sa Kwento.

Mga Aral	Pagpapakahulugan batay sa Kwento
Paggalang sa kapwa anuman ang itsura	Ipinakita sa kuwento na hindi dapat hinuhusgahan ang isang tao batay sa kanyang kulay, anyo, o estado sa buhay. Mahalaga ang pagrespeto sa dignidad ng bawat isa.
Pagtatanggol sa sarili nang may dignidad	Sa kabila ng pang-aapi, ipinakita ni Impen na may hangganan ang pagtitiis. Ang pagtatanggol sa sarili ay mahalaga, ngunit dapat itong gawin nang may tamang dahilan at hindi dahil sa galit lamang.
Pagtitiis o katatagan ng loob	Si Impen ay sumisimbolo sa isang taong marunong magtiis sa gitna ng hirap at pangungutya. Ipinapakita nito ang kahalagahan ng lakas ng loob sa pagharap sa mga pagsubok.

Paggalang sa kapwa. Ang paggalang sa kapwa ay mahalaga dahil ito ay tumutulong upang patatagin ang relasyon ng mga tao sa isang lipunan. Ang paggalang sa kapwa kahit anong katangian mayroon ang isang tao sa istado ng buhayo maging sa kulay ng balat ay marapat na magkaroon ng pantay at patas na pagtrato sa lipunang ginagalawan. Ang hindi pagtrato ng pantay sa kapwa ay may karampatang parusa sa batas ng tao at batas ng dios, ayon sa U.S Equal Employment Opportunity Commission (2024), Illegal na mangharas ng tao dahil sa lahi at kulay ng tao. Maaaring kabilang sa panghahas, halimbawa, ang mga pang-iinsultong nauugnay sa lahi, nakakapanakit o mapanirang puri na komento tungkol sa lahi o kulay ng tao, o ang pagpapakita ng mga simbolong maituturing na atake o pang-iinsulto sa lahi. Bagaman hindi ipinagbabawal ng batas ang simpleng panunukso, mga hindi inaasahang komento, o mga natatanging pangyayaring hindi gaanong nakababahala. Makikita sa inilathala at pagpapakahulugan na ang simpleng panunukso ay maaring humantong sa malaking karahasan na mas kilala bilang diskriminasyon.

Pagtatanggol sa Sarili nang may Dignidad. Lahat ng tao ay maya karapatang ipagtanggol ang sarili lalo na

kung labis na ang ginagawa ng ilan sa mga taong kasapi sa lipunan. Ang pagtanggol sa sarili ng may dignidad ay mahalagang katangian na dapat taglayin ng isang tao ng sa ganun ay maipagtanggol nito ang sarili o maging ang mga mahal nito sa buhay. Ayon pa kay Valdez (2025), ang dignidad ay nagpapahiwatig ng respeto at pagpapahalaga na ang lahat ng tao ay nararapat at pinatunayan ng mga taong mayroong isang hindi antas ng kalidad ng tao. Ang dangal ay ang kalidad ng karapat-dapat na nangangahulugang mahalaga. Batay sa nasabi ni Valdez na ang dignidad ay nagpapahiwatig ng respeto na kung saan maaring magamit ng isang taong may pinaglalabang katarungan o hustisya para sa kanyang ipinaglalaban. Ito ay ang aral na makikita rin sa kwentong Impeng Negro na maaring maging basihan ng mga mambabasa sa kwento.

Pagtitiis o katatagan ng loob. Ang pagtitiis sa mga panunukso at ang pagkakaroon ng katatagan ng loob ay isa sa mga aral na makikita sa kwentong Impeng Negro ni Rogelio Sicut. Ipinakikita dito na ang pagtitiis upang maka-iwas sa gulo ay may magandang maidudulot sa pagkatao ng mga tao sa isang lipunan. Sa inilathala ni Francisco (2024), nabanggit na maganda ang pagtitiis at hindi agad pagpatol dahil nakakaiwas ito sa gulo at pagsisisi, nagpapakita ng pagpipigil sa sarili, nakatutulong sa maayos na pakikipagkapwa, at nagbibigay ng pagkakataon upang makapag-isip ng tamang solusyon. Batay sa pagpapakahulugan at mga inilathala makikita na maganda sa pansariling ideya at pangkalahatan ang pagtitiis dahil ito ay makatutulong upang maging maayos ang kalalabasan ng plinplanong aksyon at hindi agad pagpatol. Dito makikita na ang pagtitiis at ang lakas ng loob ay magandang katangian na dapat taglayin ng isang tao katulad nalaman sa kwentog pinamagatang Impeng Negro, ang aral na ito ay mahalaga lalo na sa mga taong nakararanas ng pang-aabuso.

Batay sa mga pagpapakahulugan at mga inilathalang akda makikita na ang kwentong Impeng Negro ay may malaking epekto sa mga mambabasa kung palalalimin nito ang pagpapakahulugan sa binabasang kwento.

5. Konklusyon at Rekomendasyon

Konklusyon - Batay sa natuklasan na resulta sa pagsusuri ang mananaliksik ay nakabuo ng sumusunod na konklusyon. (1) Kabilang sa mga pagpapahalagang moral ang makikita sa kwentong Impeng Negro ni Rogelio Sicut ang paggalang, disiplina sa sarili, pagpapakumbaba, katapanagan, at katarungan. (2) Habang ang katangiang tinataglay naman ng pangunahing tauhan ay ang pagiging magalang sa magulang, may disiplina sa sarili, at ang pagiging matapang. (3) At ang aral na makukuha naman sa kwento ay ang paggalang sa kapwa anuman ang itsura, pagtatanggol sa sarili ng may dignida, at ang pagtitiis o katatagan ng loob.

Rekomendasyon - Batay sa nagging resulta at Konklusyon ng pag-aaral, inererekomenda sa susunod na mga mag-aaral at magsusuri ng piling kwento na bigyang pansin ang iba pang pagpapahalagang moral sa mga akdang pampanitikan sa Pilipinas. Iminungkahi na magkaroon ng malawakang pagsasanay patungkol sa mas malalimang pagsusuri at pag-iintindi ng mga akdang pampanitikan sa ating bansa. Iminungkahi ng manunuri na hikayatin ang mga mag-aaral na magbasa ng mga akdang kapupulutan ng mga aral na maaring gamiting sa pang-araw-araw na buhay.

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Perceived impacts of the plastic reduction ordinance on store owners in Pasacao

Avila, Leizl B. ✉

Central Bicol State University of Agriculture (Pasacao Campus), Philippines (leizlavila7@gmail.com)

Basquiña, Alvi Joy L.

Cordero, Myra B.

Guevarra, Nicole

Ojeda, Andrea Jane D.S.

Racines, Aldren P.

Talisic, Mae D.

Belbes, Mel Alvin S.

Nolasco, Michael N.



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Abstract

This study assessed the perceived impacts of Municipal Ordinance No. 01, Series of 2020, also known as the Plastic Bag Prohibition Ordinance, among store owners in Barangays Sta. Rosa Del Norte, Sta. Rosa Del Sur, and San Cirilo in Pasacao. Specifically, it determined the level of awareness and compliance of store owners regarding the ordinance, examined the relationship between awareness and compliance, and identified the ordinance's impacts on daily business operations. A descriptive-correlational research design was utilized, with 202 store owners serving as respondents. Data were gathered through survey questionnaires and analyzed using frequency count, percentage, weighted mean, and Pearson r correlation. Findings revealed that store owners possessed a very high level of awareness and compliance with the ordinance. Most respondents were categorized as highly aware and highly compliant, indicating effective dissemination and implementation of the policy by the Local Government Unit and barangay officials. The study also revealed a strong positive relationship between awareness and compliance, suggesting that higher awareness contributes to stronger adherence to environmental regulations. Furthermore, the ordinance produced both environmental and economic impacts. While respondents acknowledged reduced plastic waste and improved environmental cleanliness, they also experienced increased packaging expenses and temporary income decline due to the higher cost of eco-friendly alternatives. Overall, the findings suggest that strengthening information campaigns and providing affordable sustainable packaging options may further improve compliance and support local businesses in adapting to

environmentally responsible practices and long-term waste reduction initiatives within the municipality for the promotion of sustainable environmental practices in Pasacao.

Keywords: Plastic Bag Prohibition Ordinance, awareness, compliance, environmental sustainability, waste reduction

Perceived impacts of the plastic reduction ordinance on store owners in Pasacao

1. Introduction

Plastic pollution has emerged as one of the most pressing environmental challenges of the 21st century due to the rapid increase in global plastic production and consumption. Recent reports indicate that global plastic production has exceeded 400 million metric tons annually, with a significant portion consisting of single-use plastics that are discarded shortly after use (OECD, 2022). Despite the economic benefits of plastics, such as durability, versatility, and low production cost, their improper disposal has led to widespread environmental degradation (PlasticsEurope, 2023). An estimated 11 million metric tons of plastic waste enter the oceans each year, threatening marine biodiversity, contaminating food systems, and disrupting ecological balance (UNEP, 2021). Since plastics can take hundreds of years to decompose, their persistence in the environment has intensified global concern and highlighted the urgent need for sustainable waste management strategies and policy interventions.

Global Perspective on Plastic Pollution - At the international level, plastic pollution is recognized as a critical issue directly linked to sustainable development. The United Nations emphasized that addressing plastic waste is essential to achieving Sustainable Development Goal (SDG) 12: Responsible Consumption and Production, which promotes waste reduction through recycling and reuse, and SDG 14: Life Below Water, which focuses on preventing marine pollution (United Nations, 2025). Various countries have responded by implementing bans, levies, and extended producer responsibility (EPR) schemes targeting single-use plastics (Wang et al., 2021). Studies have shown that policy-driven interventions, such as plastic bans and improved waste management systems, can significantly reduce plastic leakage into the environment when effectively enforced (Lau et al., 2020). However, the success of these initiatives often depends on the behavioral responses and cooperation of key stakeholders, particularly those involved in production, distribution, and retail.

International Experiences on Plastic Reduction Policies - Several international studies highlight the effectiveness of stakeholder participation in zero-plastic policies. In the United Kingdom, the implementation of a plastic bag charge resulted in a reduction of over 80% in plastic bag usage, demonstrating strong consumer participation and compliance (Department for Environment, Food & Rural Affairs, 2016). Similarly, in Ireland, the implementation of a plastic bag levy led to a 90% decrease in plastic bag consumption, showing that economic instruments combined with public awareness can significantly influence behavior (Convery et al., 2007). In Rwanda, one of the strictest plastic bans globally, high compliance levels were achieved due to strong enforcement and community cooperation, leading to significant reductions in plastic waste (Behuria, 2021). In the United States, local plastic bag bans have also been associated with substantial decreases in plastic bag usage and litter, particularly when supported by public awareness campaigns and strict enforcement measures (Homonoff, 2018). These studies suggest that successful implementation of zero-plastic ordinances depends not only on policy design but also on active participation, awareness, and compliance among stakeholders.

Plastic Pollution in the Philippines - In developing countries such as the Philippines, plastic pollution remains a major environmental concern due to high plastic consumption and inadequate waste management infrastructure. The Philippines has consistently been identified as one of the top contributors to marine plastic pollution because of mismanaged waste and the widespread use of single-use plastics (Meijer et al., 2021). To address this issue, the government enacted Republic Act No. 9003, also known as the Ecological Solid Waste Management Act of 2000, which mandates waste segregation, recycling, and local government responsibility for waste management (Environmental Management Bureau, 2019). In addition, various local government units (LGUs) have implemented ordinances restricting or banning plastic use, complemented by community-based initiatives such as coastal cleanups, recycling programs, and environmental awareness campaigns (DENR, 2021). Despite these efforts, challenges remain in ensuring consistent compliance, particularly among small businesses that heavily rely

on affordable plastic packaging.

Local Plastic Reduction Policies in the Philippines - In line with the national movement to reduce plastic waste, several municipalities across the Philippines have already implemented ordinances regulating plastic use. The “No Plastic Policy” is not a single national law but rather a nationwide movement led by local government units. According to the Climate Reality Project Philippines (2022), approximately 489 cities and municipalities, representing around 30% of LGUs nationwide, have already adopted ordinances regulating plastic use. This reflects a growing national trend toward plastic reduction. A study conducted in Cabanatuan City revealed that the implementation of a plastic ban resulted in reduced plastic usage and increased environmental awareness among store owners, although challenges such as increased operational costs were also observed (Macaso, 2023).

The No Plastic Policy in Pasacao - In connection with these initiatives, the Municipality of Pasacao implemented Municipal Ordinance No. 01, Series of 2020, also known as the “Plastic Bag Prohibition Ordinance of 2020.” This local policy regulates the use and distribution of single-use plastics and Styrofoam products within the municipality to protect the environment and promote sustainable practices. It prohibits the use of plastic bags for dry goods and as secondary packaging for wet goods, as well as the use of Styrofoam containers and utensils. Limited use of plastic is only permitted for primary packaging of wet goods, while reusable, paper, or indigenous bags are encouraged. The ordinance, supported by the Municipal Environment and Natural Resources Office (MENRO), includes a three-month phase-out period, penalties for violators such as fines and suspension of business permits, and incentives for eco-friendly establishments through reward systems and express lane privileges. As a coastal municipality dependent on fishing and tourism, Pasacao is highly vulnerable to the impacts of plastic pollution, making environmental protection a critical priority for local sustainability.

Role of Store Owners in Policy Implementation - The effectiveness of such local ordinances largely depends on the participation and cooperation of store owners, who serve as key actors in implementing plastic reduction practices at the retail level. Store owners play an essential role in shaping consumer behavior, managing packaging materials, and complying with environmental regulations. Their level of awareness, perception, and capacity to adapt to policy changes directly influence the success of plastic reduction initiatives. In the Municipality of Pasacao, there is a need to examine how store owners perceive and respond to the No Plastic Policy, particularly regarding awareness, compliance, and its effects on daily business operations.

Purpose of the Study - This study aims to assess the perceived impacts of the Plastic Pollution Reduction Ordinance on store owners in three selected barangays of Pasacao and provide recommendations for improving the policy. Ultimately, this research contributes to sustainable environmental governance by aligning local initiatives with SDG 12 and SDG 14. By evaluating the experiences and responses of store owners, the study supports the development of more inclusive, practical, and effective policies that promote responsible consumption, reduce plastic waste, and protect marine ecosystems for future generations.

Statement of the Problem - This study aimed to examine the impacts of plastic pollution reduction initiatives on store owners in Barangays Sta. Rosa Del Norte, Sta. Rosa Del Sur, and San Cirilo, Pasacao. Specifically, it sought to answer the following questions:

- What is the level of awareness of store owners regarding Municipal Ordinance No. 01, Series of 2020?
- What is the level of compliance of store owners with Municipal Ordinance No. 01, Series of 2020?
- Is there a significant relationship between the level of awareness and the level of compliance of store owners in the three selected barangays?
- What is the impact of Municipal Ordinance No. 01, Series of 2020 on the daily business operations of store owners?
- Based on the findings, what recommendations can be proposed to enhance the effectiveness of the

ordinance and support store owners in adopting sustainable practices?

Objectives of the Study - This study aimed to determine the impacts of plastic pollution reduction initiatives on store owners in Barangays Sta. Rosa Del Norte, Sta. Rosa Del Sur, and San Cirilo, Pasacao. Specifically, it aimed to:

- Determine the level of awareness of store owners regarding Municipal Ordinance No. 01, Series of 2020, also known as the No Plastic Policy.
- Assess the level of compliance of store owners with Municipal Ordinance No. 01, Series of 2020.
- Examine the significant relationship between the level of awareness and the level of compliance of store owners in the three selected barangays.
- Evaluate the impact of Municipal Ordinance No. 01, Series of 2020 on the daily business operations of store owners.
- Propose recommendations based on the findings to enhance the effectiveness of the ordinance and support store owners in adopting sustainable practices.

Significance of the Study - The findings of this study will be beneficial to the following:

Local Community of Pasacao - The findings of this study will help the local community, particularly the residents of Barangays Sta. Rosa Del Norte, Sta. Rosa Del Sur, and San Cirilo, better understand the importance of reducing plastic waste and complying with environmental ordinances. It may encourage residents to adopt more sustainable consumption habits and support eco-friendly practices within their barangays. Increased awareness may also strengthen community participation in environmental protection efforts, contributing to a cleaner and healthier environment.

Local Government Unit (LGU) of Pasacao - This study will serve as a valuable reference for the Local Government Unit in evaluating the effectiveness of Municipal Ordinance No. 01, Series of 2020. The results may help identify gaps in implementation, enforcement challenges, and areas requiring improvement. Furthermore, the recommendations may assist policymakers in strengthening environmental strategies and improving support systems for affected stakeholders.

Municipal Environment and Natural Resources Office (MENRO) - This study will benefit the Municipal Environment and Natural Resources Office (MENRO) by providing data-driven insights regarding the level of awareness and compliance of store owners with the Plastic Bag Prohibition Ordinance of 2020. The findings can serve as a basis for improving environmental programs, monitoring strategies, and public information campaigns.

City Environment and Natural Resources Office (CENRO) - The results of this study may assist the City Environment and Natural Resources Office (CENRO) in understanding the effectiveness of plastic reduction initiatives at the community level. The findings may guide the office in developing more effective waste management programs, promoting sustainable practices, and supporting businesses in complying with environmental regulation.

Department of Environment and Natural Resources (DENR) - This study will be valuable to the Department of Environment and Natural Resources (DENR) as it provides empirical evidence regarding the implementation of local plastic ordinances and their impact on stakeholders. The findings may contribute to the improvement of environmental policies and strengthen solid waste management programs nationwide.

Store Owners of Barangays Sta. Rosa Del Norte, Sta. Rosa Del Sur, and San Cirilo - The study will provide store owners with insights regarding their level of awareness and compliance with the No Plastic Policy. It will also help them understand how the ordinance affects their daily business operations. Through this, store owners

may identify practical ways to adapt sustainable practices while maintaining profitability and improving environmental responsibility.

Environment - This research contributes to environmental protection by emphasizing the importance of reducing plastic waste at the local level. By assessing the implementation of the ordinance, the study supports initiatives aimed at minimizing plastic pollution, protecting marine and terrestrial ecosystems, and promoting sustainable waste management practices.

Future Researchers - This study will serve as a useful reference for future researchers who wish to explore topics related to environmental policies, plastic waste management, and sustainable business practices. It may provide a foundation for further studies involving long-term impacts, policy comparisons, and innovative solutions to plastic pollution.

Scope and Limitation of the Study - This study focused on examining the perceived impacts of the Plastic Pollution Reduction Ordinance, specifically Municipal Ordinance No. 01, Series of 2020, also known as the Plastic Bag Prohibition Ordinance, on store owners in selected barangays of Pasacao. The study was limited to store owners operating within Barangays Sta. Rosa Del Norte, Sta. Rosa Del Sur, and San Cirilo. It aimed to assess their level of awareness and compliance with the ordinance, determine the relationship between awareness and compliance, and evaluate the effects of the policy on daily business operations. The respondents of the study were limited exclusively to store owners, including sari-sari store operators and small retail business owners, within the selected barangays. Other stakeholders such as consumers, local officials, suppliers, and waste management personnel were not included in the study. Data were gathered using a structured survey questionnaire designed to measure awareness, compliance, and perceived impacts of the ordinance. Furthermore, the study was confined to the current implementation of the ordinance and did not cover its historical development or long-term environmental outcomes. It focused only on selected variables such as awareness, compliance, and operational impact and excluded other factors such as financial performance, customer behavior, and broader economic effects. The findings of this study are limited to the selected barangays in Pasacao and may not be generalized to other municipalities or regions with different socio-economic and environmental conditions. In addition, the study relied on the honesty and accuracy of the respondents' answers, which may be subject to bias and personal interpretation. Despite these limitations, the study provides valuable insights into the implementation of local plastic reduction policies and supports the improvement of environmental programs and sustainable business practices.

Theoretical Framework - This study is anchored on three relevant theories: the Theory of Planned Behavior (TPB) by Icek Ajzen (1991), the Stakeholder Theory by R. Edward Freeman (1984), and the Tragedy of the Commons Theory by Garrett Hardin (1968). These theories collectively explain the behavioral, managerial, and environmental dimensions underlying plastic pollution reduction initiatives and their perceived impact on store owners in Pasacao.

Theory of Planned Behavior (TPB) - The Theory of Planned Behavior (TPB) developed by Icek Ajzen (1991) explains that an individual's behavior is influenced by behavioral intention, which is shaped by attitude, subjective norms, and perceived behavioral control. In this study, the theory is applied to understand how store owners respond to the implementation of the No Plastic Policy. The level of awareness of store owners regarding the ordinance may influence their attitude toward reducing plastic use, whether they perceive it as beneficial or burdensome. Subjective norms refer to the influence of customers, the community, and the Local Government Unit (LGU), which may encourage compliance. Perceived behavioral control reflects the store owners' ability to adopt alternative packaging materials and adjust their business practices. These factors collectively influence their level of compliance with the ordinance, suggesting that increased awareness may lead to more positive environmental behavior.

Stakeholder Theory - Stakeholder Theory by R. Edward Freeman (1984) emphasizes that the success of policies and organizational practices depends on the involvement and cooperation of stakeholders who are affected by or interested in the outcomes. In this study, store owners, the Local Government Unit (LGU), consumers, and

the local community are considered key stakeholders in implementing the Plastic Pollution Reduction Ordinance. Store owners are directly affected because they are required to modify their business practices, while the LGU is responsible for policy enforcement and support. Consumers and the community also influence compliance through their preferences and expectations for environmentally responsible practices. The interaction among these stakeholders significantly affects the effectiveness of the ordinance, highlighting the importance of collaboration, shared responsibility, and mutual support in achieving sustainable environmental goals.

Tragedy of the Commons Theory - The Tragedy of the Commons Theory by Garrett Hardin (1968) explains how shared environmental resources are often overused and degraded when individuals act according to self-interest without considering the collective good. In the context of this study, plastic pollution represents a common environmental problem resulting from the excessive use and improper disposal of plastic materials by businesses and consumers. Store owners may prioritize convenience and cost-efficiency by continuing to use plastic packaging, which contributes to environmental degradation, particularly in coastal areas such as Pasacao. The implementation of the No Plastic Policy serves as a regulatory intervention to minimize plastic overuse and protect shared environmental resources. This theory highlights the importance of regulations, collective action, and responsible behavior in achieving environmental sustainability.

2. Research methodology

Research Method - This study employed a quantitative research method. This approach was used to collect numerical data that could be statistically analyzed to answer the research questions. A structured survey questionnaire served as the primary data-gathering instrument in obtaining information regarding the level of awareness, level of compliance, and perceived impacts of the ordinance on store owners. The quantitative method was considered appropriate because it enabled the researchers to objectively measure variables, identify patterns, and determine the relationship between awareness and compliance. Furthermore, it allowed the use of statistical tools to ensure the accuracy, reliability, and validity of the findings.

Research Locale - The study was conducted in the Municipality of Pasacao, specifically in Barangays Sta. Rosa Del Norte, Sta. Rosa Del Sur, and San Cirilo. These barangays were selected because they are among the busiest commercial areas in the municipality where many small and medium-sized businesses operate. Pasacao is a coastal municipality, making it highly vulnerable to the effects of plastic pollution, particularly in marine and coastal environments. The selected barangays are known to have numerous sari-sari stores and small retail establishments that are directly affected by the implementation of the No Plastic Policy. The locale was considered appropriate for the study because it provided a relevant setting for assessing the awareness, compliance, and perceived impacts of the ordinance among store owners within the area.

Data Gathering Procedure - The researchers followed a systematic process in gathering the necessary data for the study. Initially, the researchers prepared the required research documents and secured approval from the research adviser and panelists. After approval, a notice to proceed was granted, allowing the researchers to formally conduct the study. A formal request letter was then submitted to the Local Government Unit (LGU) of Pasacao and to the barangay officials of Sta. Rosa Del Norte, Sta. Rosa Del Sur, and San Cirilo to seek permission to conduct the study within their jurisdiction. Upon obtaining approval, the researchers coordinated with local officials to identify the store owners who would serve as respondents. The data gathering was conducted on-site through face-to-face interviews using a structured survey questionnaire. Each selected store owner was personally approached, and the purpose, objectives, and procedures of the study were clearly explained before the interview. Consent was obtained from the respondents prior to participation. During the interview, the researchers directly recorded the responses of the participants to ensure the accuracy and completeness of the data gathered. This method also allowed the researchers to clarify questions whenever necessary and ensured that all questionnaire items were properly answered. After the interviews, the collected data were reviewed, organized, encoded, and tabulated for statistical analysis. Throughout the process, ethical considerations such as voluntary participation, confidentiality, and anonymity of respondents were strictly observed.

Population and Sampling Design - The population of the study consisted of store owners operating in Barangays Sta. Rosa Del Norte, Sta. Rosa Del Sur, and San Cirilo in Pasacao. The respondents specifically included store owners with valid business permits who were actively operating within the selected barangays. These individuals were selected because they were directly affected by and involved in the implementation of Municipal Ordinance No. 01, Series of 2020, also known as the Plastic Bag Prohibition Ordinance. A total of 202 respondents participated in the study. Of this number, 67 respondents came from Barangay Sta. Rosa Del Norte, 73 from Barangay Sta. Rosa Del Sur, and 62 from Barangay San Cirilo. The study employed probability sampling, specifically simple random sampling, in selecting the respondents. Store owners with valid business permits and actively operating within the identified areas were included in the sampling frame. From this group, respondents were randomly selected to ensure that each eligible store owner had an equal opportunity to participate in the study. This sampling technique was considered appropriate for quantitative correlation analysis because it minimized selection bias and improved representativeness (Creswell & Creswell, 2018). The use of this technique ensured fairness in respondent selection and increased the reliability of the data gathered, allowing the findings to better reflect the awareness, compliance, and perceived impacts of the ordinance among store owners in the selected barangays.

Ethical Considerations - The researchers ensured that all ethical standards were strictly observed throughout the conduct of the study. Prior to data gathering, permission was secured from the research adviser and panelists, followed by the issuance of a notice to proceed. Approval was also obtained from the Local Government Unit (LGU) of Pasacao and the respective barangay officials of Sta. Rosa Del Norte, Sta. Rosa Del Sur, and San Cirilo to conduct the study within their jurisdiction. Participation in the study was entirely voluntary. The researchers clearly explained the purpose, objectives, and procedures of the study to the respondents before conducting the interviews. Consent was obtained from all participants before proceeding with data collection. The researchers also ensured the confidentiality and anonymity of all respondents. Personal information such as names and business details was not disclosed in any part of the study. All responses were treated with strict confidentiality and were used solely for academic and research purposes in compliance with Republic Act No. 10173, also known as the Data Privacy Act of 2012. Furthermore, honesty and integrity were maintained throughout the data collection, recording, and analysis processes. No data were fabricated, altered, or misinterpreted. The findings were presented accurately and objectively. Proper acknowledgment was also given to all sources and references used in the study to uphold academic integrity and avoid plagiarism. Lastly, the researchers ensured that the study posed no harm to the respondents. The questions asked were relevant to the objectives of the study and did not invade personal privacy or cause discomfort. Respect, professionalism, and cultural sensitivity were observed throughout the interaction with respondents.

Statistical Treatment of Data - The data collected in this study were analyzed using appropriate statistical tools to ensure accurate interpretation of the findings. Percentage was used to determine the proportion of respondents based on variables such as awareness and compliance levels. It was computed using the formula: The weighted mean was used to determine the average responses regarding awareness and compliance levels and served as a measure of central tendency (Sevilla, 2007). A Likert scale was also utilized to measure respondents' awareness and compliance regarding plastic pollution initiatives, with corresponding numerical values ranging from 1 to 4. The resulting mean scores were interpreted using the following ranges: 3.26–4.00 interpreted as Very High, 2.51–3.25 as High, 1.76–2.50 as Low, and 1.00–1.75 as Very Low. Lastly, the Spearman Rank-Order Correlation Coefficient (Spearman's ρ) was used to determine the relationship between awareness and compliance because the data gathered were ordinal in nature and based on Likert-scale responses. The coefficient ranges from -1 to +1, indicating the strength and direction of the relationship between variables. A 0.05 level of significance was used to determine statistical significance (GeeksforGeeks, 2026).

3. Results and discussion

This section presents, analyzes, and interprets the data gathered regarding the awareness, compliance, relationship between awareness and compliance, and the perceived impacts of Municipal Ordinance No. 01, Series

of 2020, also known as the Plastic Bag Prohibition Ordinance, among store owners in Barangays Sta. Rosa Del Norte, Sta. Rosa Del Sur, and San Cirilo in Pasacao. The findings are discussed and supported by relevant literature and theories related to environmental awareness, policy compliance, and sustainable practices.

3.1 Level of Awareness of Store Owners Regarding Municipal Ordinance No. 01, Series of 2020

The findings revealed that the majority of store owners in the selected barangays possess a very high level of awareness regarding Municipal Ordinance No. 01, Series of 2020, also known as the No Plastic Policy. Out of 202 respondents, 108 respondents or 53.47% were categorized as Highly Aware, 74 respondents or 36.63% were categorized as Aware, and 20 respondents or 9.90% were categorized as Somewhat Aware. No respondents were classified as Not Aware. The overall weighted mean of 3.44 indicates a Very High level of awareness among store owners. In Barangay Sta. Rosa Del Norte, the majority of respondents were Highly Aware, with 40 respondents or 59.70%, while only 6 respondents or 8.96% were classified as Somewhat Aware. The computed weighted mean of 3.51 indicates a Very High level of awareness. In Barangay Sta. Rosa Del Sur, 36 respondents or 49.32% were Highly Aware, while 10 respondents or 13.70% were Somewhat Aware. The weighted mean of 3.36 also reflects a Very High level of awareness. Similarly, in Barangay San Cirilo, 32 respondents or 51.61% were Highly Aware, while only 4 respondents or 6.45% were Somewhat Aware. The computed weighted mean of 3.45 likewise indicates a Very High level of awareness.

Awareness is considered a crucial factor in the successful implementation of environmental policies because it reflects how well individuals understand the purpose, provisions, and implications of such regulations. Studies indicate that higher levels of awareness regarding environmental issues, particularly plastic pollution, contribute to more positive attitudes and responsible environmental practices. Public awareness is also considered an important factor in influencing behavioral change and strengthening policy support within communities. The results suggest that the ordinance has been effectively communicated to store owners in the selected barangays. This may be attributed to the efforts of the Local Government Unit (LGU), barangay officials, and environmental campaigns conducted within the municipality. The absence of respondents categorized as Not Aware further indicates that the policy has reached the target population successfully. However, the presence of respondents under the Somewhat Aware category suggests that not all store owners possess complete understanding of the ordinance and its provisions. This implies that awareness alone may not always guarantee full comprehension and proper implementation of the policy. Some store owners may only be familiar with the existence of the ordinance without fully understanding its objectives and environmental significance.

The findings support studies emphasizing that environmental awareness does not always translate into complete understanding or actual environmental behavior. Research also highlights the existence of a knowledge-action gap in environmental practices, wherein individuals may recognize environmental issues but still lack sufficient understanding regarding sustainable practices and policy implementation. The findings are best explained through the Theory of Planned Behavior (TPB) by Icek Ajzen (1991), which states that awareness and knowledge influence an individual's attitudes and intentions toward a specific behavior. The very high level of awareness among store owners suggests a greater likelihood of developing positive attitudes toward the No Plastic Policy, which may eventually lead to stronger compliance with environmental regulations.

3.2 Level of Compliance of Store Owners with Municipal Ordinance No. 01, Series of 2020

The findings revealed that store owners in the selected barangays generally demonstrate a very high level of compliance with Municipal Ordinance No. 01, Series of 2020. Out of 202 respondents, 90 respondents or 45% were categorized as Highly Compliant, 87 respondents or 43% were Moderately Compliant, and 25 respondents or 12% were Somewhat Compliant. No respondents were classified as Not Compliant. The overall weighted mean of 3.33 indicates a Very High level of compliance among store owners. In Barangay Sta. Rosa Del Norte, the majority of respondents were Moderately Compliant, with 34 respondents or 50.75%, while only 8 respondents or 11.94% were categorized as Somewhat Compliant. The computed weighted mean of 3.25 indicates a High level

of compliance. In Barangay Sta. Rosa Del Sur, 35 respondents or 47.95% were categorized as Highly Compliant, while 8 respondents or 10.96% were Somewhat Compliant. The weighted mean of 3.37 indicates a Very High level of compliance. Similarly, in Barangay San Cirilo, 30 respondents or 48.39% were Highly Compliant, while 9 respondents or 14.52% were Somewhat Compliant. The weighted mean of 3.34 also reflects a Very High level of compliance.

Compliance with environmental policies is essential in minimizing environmental degradation and promoting sustainable practices. Studies indicate that policy compliance is influenced by awareness, enforcement mechanisms, and the perceived benefits of environmental regulations. High compliance among small business owners reflects effective implementation and enforcement of local environmental policies. The findings indicate that store owners generally follow the provisions of the No Plastic Policy. The absence of non-compliant respondents suggests that the ordinance has been effectively implemented and accepted within the community. However, the presence of moderately and somewhat compliant respondents implies that some store owners may still encounter difficulties in fully complying with the ordinance. These challenges may include limited availability of eco-friendly packaging materials and the higher cost of sustainable alternatives.

The results further imply that the ordinance has contributed to positive behavioral change among store owners. Nevertheless, varying levels of compliance indicate that some businesses may only meet the minimum requirements of the ordinance rather than fully adopting sustainable practices. This supports studies emphasizing that long-term environmental behavior requires continuous education, monitoring, and reinforcement. The findings are best explained through the Theory of Planned Behavior (TPB) by Icek Ajzen (1991). According to the theory, behavior is influenced by intention, which is shaped by attitudes, subjective norms, and perceived behavioral control. The high level of compliance among store owners suggests that they have developed positive attitudes toward the ordinance, perceive social and regulatory pressure to comply, and believe that they can follow the policy.

3.3 Relationship Between the Level of Awareness and Compliance of Store Owners in the Selected Barangays

The findings revealed a strong positive relationship between the level of awareness and compliance of store owners regarding Municipal Ordinance No. 01, Series of 2020. The computed r-value of 0.82 indicated a strong positive correlation, while the computed t-value of 5.67 exceeded the critical value of 2.00 at the 0.05 level of significance, confirming a statistically significant relationship. The results suggest that store owners with higher awareness of the ordinance are more likely to comply with its provisions. This indicates that understanding environmental policies influences sustainable behavior and decision-making. The findings also imply that awareness campaigns conducted by the Local Government Unit (LGU) and barangay officials were effective in promoting compliance. However, compliance may also be influenced by factors such as the availability of eco-friendly alternatives, economic considerations, enforcement measures, and support from local authorities. Continuous education, monitoring, and policy reinforcement therefore remain important in sustaining environmental responsibility. The findings support previous studies showing that environmental awareness positively influences compliance with environmental regulations and sustainable practices. These findings are further explained by the Icek Ajzen's Theory of Planned Behavior, which states that awareness and knowledge influence attitudes and intentions, leading individuals to perform specific behaviors.

3.4 Impacts of Municipal Ordinance No. 01, Series of 2020 on Daily Business Operations of Store Owners

The findings revealed that the implementation of the Plastic Bag Prohibition Ordinance of 2020 produced both environmental and economic impacts on store owners in the selected barangays of Pasacao. Some respondents experienced difficulties adjusting to the ordinance during its initial implementation, while others reported a temporary decrease in income due to changes in customer behavior and business practices. All respondents also reported increased packaging expenses because eco-friendly alternatives are more costly than plastic materials. Despite these challenges, respondents recognized the environmental benefits of the ordinance, particularly in reducing plastic waste and improving environmental cleanliness within the municipality. However, many still

considered the ordinance burdensome because of the high cost of sustainable packaging materials.

The findings suggest that the ordinance has a dual impact: it promotes environmental protection and sustainable practices while also creating financial and operational challenges for store owners. The temporary decline in sales further indicates that consumers initially resisted changes in packaging practices but gradually adapted over time. The study also implies that the success of environmental policies depends on the availability of affordable alternatives and adequate support for affected stakeholders. Financial assistance, continuous education, and access to affordable eco-friendly packaging may help reduce the burden on small business owners. The findings are supported by R. Edward Freeman's Stakeholder Theory and Garrett Hardin's Tragedy of the Commons, which emphasize cooperation, shared responsibility, and regulation in addressing environmental problems.

4. Summary, findings, conclusions, and recommendations

Summary - This study aimed to assess the level of awareness and compliance of store owners regarding the Plastic Bag Prohibition Ordinance of 2020 in selected barangays. Specifically, it sought to determine the level of awareness, level of compliance, the relationship between awareness and compliance, and the impacts of the ordinance on business operations. The study utilized a quantitative research design, employing a survey questionnaire as the primary data-gathering instrument. Respondents were randomly selected store owners with valid business permits operating within the identified areas. Statistical tools such as frequency, percentage, weighted mean, and Spearman Rank Correlation were used to analyze the data. The findings served as the basis for drawing conclusions and formulating recommendations to improve policy implementation and support sustainable practices.

Findings, Conclusions, and Recommendations

Problem 1: What is the level of awareness of store owners regarding the Municipal Ordinance No. 01, Series of 2020?

Findings - The findings revealed that store owners generally have a high level of awareness of the Plastic Bag Prohibition Ordinance of 2020. Out of 202 respondents, the majority were classified as Highly Aware (108 or 53%), followed by Aware (74 or 37%), and Somewhat Aware (20 or 10%), with no respondents under the Not Aware category. The computed overall weighted mean indicated a high level of awareness. While most respondents are knowledgeable about the existence and purpose of the ordinance in reducing plastic waste, some store owners demonstrated limited understanding of its specific provisions and detailed guidelines.

Conclusion - It can be concluded that although awareness of the ordinance is high among store owners, it does not necessarily equate to full comprehension of its details. Awareness alone is insufficient to ensure effective implementation, as some respondents may only have surface-level knowledge of the policy.

Recommendation - It is recommended that the LGU strengthen information dissemination through continuous education campaigns, seminars, and clear communication of the ordinance's provisions to ensure a deeper and more comprehensive understanding among store owners.

Problem 2: What is the level of compliance of store owners with the Municipal Ordinance No. 01, Series of 2020?

Findings - The findings indicated that store owners exhibit a high to very high level of compliance with the ordinance across the selected barangays. Among the 202 respondents, Highly Compliant (90 or 45%) and Moderately Compliant (87 or 43%) comprised the majority, followed by Somewhat Compliant (25 or 12%), with no respondents identified as Not Compliant. The overall weighted mean of 3.33 indicates a very high level of compliance. This suggests that most store owners are adhering to the policy, although some may not be fully consistent in its implementation.

Conclusion - It can be concluded that the ordinance has been effectively implemented, as reflected in the high level of compliance among store owners. However, variations in the degree of compliance suggest that some challenges still exist in achieving full and consistent adherence.

Recommendation - It is recommended that the LGU maintain strict monitoring and enforcement while providing continuous support to store owners to ensure consistent compliance. Additional guidance and resources should also be provided to address challenges faced by partially compliant respondents.

Problem 3: Is there a significant relationship between the level of awareness and level of compliance of store owners in the three selected barangays?

Findings - The results showed a perfect positive correlation between awareness and compliance, with a computed Spearman Rank Correlation coefficient (ρ) of 1.00. The data revealed identical ranking patterns across all categories, where Highly ranked first (108 awareness; 90 compliance), followed by Moderately (74 awareness; 87 compliance), Somewhat (20 awareness; 25 compliance), and Not (0 for both variables). These results confirm a strong and direct relationship between the two variables, indicating that as awareness increases, compliance also increases.

Conclusion - It can be concluded that awareness is a significant factor influencing compliance among store owners. Higher awareness leads to better adherence to the ordinance, highlighting the importance of knowledge in shaping behavior.

Recommendation - It is recommended that awareness campaigns be further strengthened, as increasing awareness can directly improve compliance. The LGU should continue investing in educational initiatives and community engagement to sustain and enhance this relationship.

Problem 4: What is the impact of the Municipal Ordinance No. 01, Series of 2020 on the daily business operations of the store owners?

Findings - The findings revealed that the ordinance has both positive and negative impacts on store owners. The most reported challenge was difficulty in adjusting to the ordinance, with 45 respondents (22.27%) indicating this as a primary concern. Additionally, 75 respondents (37.12%) reported a temporary decrease in income during the initial implementation, while all respondents (202 or 100%) experienced increased packaging costs due to more expensive alternatives. On the positive side, 35 respondents (17.32%) noted a reduction in plastic usage, and 33 respondents (16.33%) reported increased environmental awareness. Furthermore, 29 respondents (14.35%) recognized the ordinance's contribution to reducing plastic waste in the community. Despite these challenges, store owners gradually adapted, and business operations stabilized over time.

Conclusion - It can be concluded that the Plastic Bag Prohibition Ordinance of 2020 has a dual impact on store owners, promoting environmental sustainability while imposing economic and operational challenges. Despite these difficulties, store owners show adaptability and recognize the benefits of the policy.

Recommendation - It is recommended that the LGU provide financial assistance or subsidies, ensure access to affordable alternatives, and implement support programs to ease the burden on store owners. Strengthening collaboration among stakeholders is also essential to balance environmental goals and business sustainability.

Problem 5: Based on the findings, what recommendations can be made to enhance the effectiveness of the ordinance and support store owners in adopting sustainable practices?

Overall Recommendations - Based on the findings of the study, it is recommended that the Local Government Unit (LGU) strengthen the implementation of the Plastic Bag Prohibition Ordinance of 2020 through continuous information dissemination, educational campaigns, seminars, and barangay-level orientations to improve awareness and compliance among store owners and consumers. Programs promoting sustainable practices, waste

reduction, and proper policy implementation should also be conducted regularly. The LGU should likewise provide financial assistance, subsidies, or incentive programs to help store owners manage the increased costs of eco-friendly packaging materials. Partnerships with suppliers and local producers may also help ensure the affordability and availability of sustainable packaging alternatives. In addition, strict monitoring and consistent enforcement of the ordinance should be maintained across all barangays. Consumer participation should also be encouraged through reusable bag campaigns and community-based initiatives such as “Bring Your Own Bag” programs. Finally, regular evaluations and stakeholder consultations should be conducted to assess the effectiveness of the ordinance, address implementation challenges, and improve the policy while balancing environmental sustainability and the economic welfare of store owners.

Practical Educational Implications - The findings of this study provide practical educational implications for teachers, students, school administrators, and local policymakers in promoting environmental awareness and sustainable practices. The study highlights the importance of integrating environmental education, particularly plastic waste management and pollution reduction, into classroom discussions and community-based activities. Teachers may use the results of this research as reference material in discussing environmental protection, ecological responsibility, and local government ordinances related to waste management. For students, the study enhances awareness of the effects of plastic pollution and the importance of practicing responsible waste disposal and the use of eco-friendly alternatives. The findings may encourage learners to actively participate in environmental programs, campaigns, and school initiatives that support sustainability and community cleanliness. Through increased environmental consciousness, students may develop values and behaviors that contribute to long-term environmental protection. Schools and educational institutions may also use the findings as a basis for strengthening school policies related to waste segregation, plastic reduction, and environmental conservation programs. The study may support the implementation of seminars, clean-up drives, recycling projects, and information campaigns that promote environmental responsibility among stakeholders. Furthermore, local government units and community leaders may utilize the findings in improving existing no-plastic policies and developing more effective strategies for ordinance implementation and public participation.

AI Use Disclosure - This study utilized ChatGPT by OpenAI as an artificial intelligence (AI) tool for language editing, grammar checking, sentence refinement, and assistance in organizing portions of the manuscript. All generated outputs were carefully reviewed, verified, and edited by the authors. The researchers ensured the accuracy and validity of the content, including interpretations, analysis, and conclusions presented in the study. No confidential or personally identifiable information was entered into the AI tool. The authors take full responsibility for the integrity and content of this manuscript.

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Tula sa makabagong panahon: Isang Phenomenolohikal na pag-aaral sa karanasan ng mga Guro

De Ramon, Natividad L. ✉

Sorsogon State University, Sorsogon, Philippines (deramon.natividad@sorsu.edu.ph)

Marbella, Felisa D.

Sorsogon State University, Sorsogon, Philippines (Felymarbella03@gmail.com)

Mariano, Sharon D.

Sorsogon State University, Sorsogon, Philippines (sharondivinamariano@gmail.com)



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Abstract

Sa kabila ng dumaraming pananaliksik hinggil sa pagtuturo ng asignaturang Filipino, nanatiling kulang ang mga pag-aaral na tumutugon partikular sa phenomenolohikal na karanasan ng mga guro, ang mga umiiral na pananaliksik ay nakasentro sa tradisyonal na anyo ng panulaan. Samantalang ang kasalukuyang pag-aaral ay tungkol sa tula sa makabagong panahon: isang phenomenolohikal na pag-aaral sa karanasan ng mga guro. Ang disenyong ginamit ng pananaliksik ay kwalitatibong at phenomenological approach. Ang layunin ng pananaliksik ay alamin at unawain ang mga karanasan, pananaw at damdamin ng mga guro hinggil sa paggamit ng tula sa pagtuturo sa makabagong panahon bilang susi sa pagkatuto sa kontemporaryong panahon. Sa ginawang pag-aaral nakita na ang pagtuturo at paggamit ng tula sa makabagong panahon ay dumaraan sa mahalagang pagbabago. Hindi lamang nakasentro ang mga guro sa tradisyunal na pagbasa at pagsusuri ng tula, kundi higit na ginagamit ang teknolohiya, digital platforms at malikhaing estratehiya gaya ng spoken word poetry at video presentation upang gawin mas makabuluhan at interaktibo ang karanasan ng mga mag-aaral. Napatunayan din na ang mga mag-aaral ay positibong tumutugon sa mga tulang may temang panlipunan, lalo na kung ito'y ipinapahayag sa pamamagitan ng makabagong teknolohiya. Dahil dito, higit nilang makikita ang tula bilang mabisang daluyan ng pagbabahagi ng damdamin, opinyon, at pakikiisa sa lipunan. Natukoy sa ginawang pag-aaral ang dual role ng tula sa kasalukuyan: una, bilang tagapagdala ng tradisyon at kultura, pangalawa, bilang espasyo ng inobasyon at kritikal na pag-iisip. Isa pang natatanging tuklas ang malinaw na paglutang ng hamon na kinakaharap ng mga guro-ang kakulangan ng interest ng ilang mag-aaral sa tradisyon na tula, na higit nanaakit sa visual at digital media. Gayunpaman, lumitaw na ang paggamit ng tula'y may malawak na benepisyo hindi lamang sa larangan ng wika at pagbasa, kundi maging sa paglinang ng empatiya, malikhaing kasanayan, at kritikal na pag-iisip ng mga mag-aaral.

Keywords: tula, karanasan, pagkatuto, phenomenolohikal, panahon

Tula sa makabagong panahon: Isang Phenomenolohikal na pag-aaral sa karanasan ng mga Guro

I. Introduksiyon

Sa patuloy na pag-unlad ng teknolohiya at pagbabago ng pananaw ng kabataan sa edukasyon, nahaharap ang panitikan sa hamon ng pagiging makabuluhan sa makabagong panahon. Isa sa mga anyo ng panitikan na nananatiling buhay at may kakayahang umangkop sa pagbabago ng tula. Mula sa pagiging daluyan ng damdamin, saloobin, at karanasan ng mga sinaunang Pilipino, unti-unti nang nagbabagong-anyo ang tula upang umangkop sa kontemporaryong henerasyon. Sa pamamagitan ng social media, spoken word poetry, at makabagong anyo ng pagsulat, patuloy nitong hinahawakan ang landas tungo sa mas malawak na pang-unawa at pagpapahalaga sa kultura, identidad, at karanasan ng kabataan ngayon. Sa ganitong konteksto, ang tula ay nagiging *susi ng pagkatuto*—hindi lamang sa larangan ng wika at panitikan kundi maging sa paglinang ng kritikal na pag-iisip, sempatiya, at malikhaing pagpapahayag. Sa panahong ang impormasyon ay mabilis na dumaloy at ang atensyon ng mga mag-aaral ay laging hinahati ng teknolohiya, muling pinatutunayan ng tula ang kahalagahan nito bilang makapangyarihang kasangkapan sa edukasyon at pang-unawa sa makabong lipunan.

Sa pandaigdigang pananaw, ang *panulaan o poetry* ay patuloy na kinikilala bilang makapangyarihang kasangkapan sa edukasyon at paghubog ng kamalayan, lalo na sa gitna ng mabilis na pagbabago sa kontemporaryong panahon. Sa kabila ng modernisasyon at pagsulpot ng teknolohiya, hindi naisantabi ang halaga ng tula bilang daluyan ng pagkatuto, pagbibigay-diin sa identidad, at pagpapalawak ng pang-unawa sa mga isyung panlipunan. Ayon sa pag-aaral sa Estados Unidos at ilang bansa sa Europa (Armitage, 2021), ang tula ay isang mabisang kasangkapan upang mapaunlad ang *kritikal thinking* at *empathy* sa mga mag-aaral. Sa pamamagitan ng mga makabagong anyo tulad ng SWP at slam poetry, naisasabuhay ng mga kabataan ang kanilang karanasan, damdamin, at pananaw sa mga isyung gaya ng diskriminasyon, krisis sa klima at pagkapantay-pantay. Isinusulong ng mga edukador sa mga bansang ito ang paggamit ng tula upang paigtingin ang literasiyang panlipunan at emosyonal ng mga mag-aaral.

Samantala, sa mga bansang gaya ng United Kingdom, Canada at Australia, lumalaganap ang tinatawag na *digital poetry o multimodal poetry*—isang uri ng panulaan na sinusupportahan ng teknolohiya tulad ng video, musika, at sining biswal. Ayon sa British Council (2020), ang ganitong uri ng tula ay ginagamit sa mga paaralan upang hikayatin ang kabataan na maging mas engaged sa pagbabasa at pagsusulat. Pinatatag din nito ang kanilang kakayahan sa paggamit ng wika, pagsasalaysay, at malikhaing pag-iisip. Sa konteksto naman ng Africa at Latin America, tulad ng South Africa at Brazil, ginagamit ang tula upang itaguyod ang *multilinggwalismo* at mapanatili ang *katutubong kultura* sa gitna ng globalisasyon. Ayon sa ulat ng UNESCO (2019), isinsama ang panulaan sa kurikulum upang mapalalim ang ugnayan ng mga kabataan sa kanilang mga pinagmulan, gamit ang wika ng kanilang ninuno. Sa pamamagitan nito, ang panitikan ay nagiging tulay upang mapanatili ang kultural na identidad.

Hindi rin maikakaila ang papel ng tula sa *pagpapahayag ng protesta at paghilom* sa mga rehiyong may kaguluhan gaya ng middle East at ilang bahagi ng Asya. Sa mga bansang tulad ng Iran, Palistina, at Myanmar, ang panulaan ay ginagawang plataporma ng mga kabataan upang ipahayag ang kanilang damdamin ukol sa digmaan, opresyon at kawalana ng katarungan. Ayon kay Al-Mutairi (2022), ang tula ay hindi lamang sining kundi aktibong bahagi ng *resistance literature* na nagsisilbing tinig ng mga pinatahimik. Lumilitaw na sa iba't ibang panig ng mundo ang tula sa makabagong panahon ay hindi lamang anyo ng sining, kundi isang susi ng pagkatuto—mula sa paghubog ng kaisipan at damdamin, pagpapalawak ng pananaw, hanggang sa paglinang ng kamalayang panlipunan. Sa paggamit ng panulaan bilang daluyan ng edukasyon at pakikilahok sa lipunang naisasakutuparan ang layuning gawing makabuluhan, makabago, at makatao ang kontemporaryong pagkatuto.

Ayon kay Eilish Dillon (2022) sa kanyang “Tula bilang Kasangkapan sa Makabagong Edukasyon”. tinalakay

ang potensyal ng tula sa pagpapalalim ng kritikal na pagkatuto sa global na edukasyon. Ayon sa kanya, ang tula ay maaaring magbukas ng mas malalim na pag-unawa at personal na koneksyon sa mga isyung panlipunan, bagaman kailangan pa ng mas sistematikong pag-aaral upang patunayan ito. Sa larangan ng agham, ipinakita ng isang pag-aaral kung paano nakatulong ang pag-sulat ng tula sa mga estudyante upang mas maunawaan at maipahayag ang kanilang kaalaman sa kalikasan, na nagpapakita ng mas mataas na antas ng personal na pag-unawa at koneksyon sa paksa.

Kay Aman Gorman (2022), sa kanyang “Tula sa kontemporaryong Kultura at Edukasyon” isang kilalang makata, ay naglunsad ng *Master Class* upang turuan ng pagsulat at pagbigkas ng tula, na may layuning gawing mas accessible ang tula sa mas maraming tao at gamitin ito bilang kasangkapan para sa pagbabago sa lipunan. Ocean Vuong (2022), isang Vietnamese- American na makata, ay gumamit ng tula upang ipahayag ang kanyang pananaw sa makabagong buhay, na nagpapakita ng kahalagahan ng tula sa personal na pag-unlad at edukasyon. Ipinakita ng isang pag-aaral kung paano maaaring gamitin ang tula sa iba’t ibang asignatura tulad ng matematika, agham, at kasaysayan upang mapalalim ang pang-unawa at pagkamalikhain ng mga estudyante. Sa panahon ng pandemya, ginamit ang tula bilang paraan ng mga estudyante upang iproseso ang kanilang mga emosyon at karanasan, na nagpapakita ng papel ng tula bilang coping mechanism at kasangkapan sa pagkatuto.

Ayon sa isang Artikulo, (2023) ang pagsasama ng kontemporaryong tula sa kurikulum ay maaaring magbigay ng mas malalim na koneksyon sa mga estudyante, na nagpapalawak ng kanilang pang-unawaa sa kultura, kasaysayan at emosyon. Iminungkahe rin ng isang pag-aaral ang paggamit ng multimodal na pamamaraan sa pagtuturo ng tula, tulad ng paggamit ng digital media at performance, upang mapalawak ang karanasan ng mga estudyante at gawing mas interkibo ang pagkatuto. Sa Pilipinas, ang panulaang Filipino ay patuloy na yumayabong bilang mahalagang kasangkapan sa paghubog ng kaisipan, damdamin, at kamalayan ng mga mag-aaral sa makabagong panahon. Ayon sa pag-aaral ni Morales, M. (2014) na pinamagatang “Pagsusuri ng mga Makabagong Tulang Filipino Tungo sa Pagbuo ng Mungkahing Balangkas sa Pagtuturo”, Napatunayan epektibo ang paggamit ng makabagong tula sa paglinang ng masusing pag-unawa at malikhaing pag-iisip sa mga estudyante, sa kanyang pag-aaral, iminungkahi ang paggamit ng mga graphis organizers rulad ng storyboard at cause-and - effect chart upang mas mapadali ang pagsusuri ng tula at matulungan ang mga mag-aaral sa pagbuo ng interpretasyon.

Samantala, sa pag-aaral ni Juanco, C., (2021). na may pamagat “*Makabagong Pamamaraan sa Pagtuturo ng Asignaturang Filipino: Pagtataya sa Teknolohikal, Pedagogikal at Kaalamang Pangnilalaman*” sinuri sa pananaliksik na ito ang kasaysayan ng mga guro sa paggamit ng teknolohiya ay nakatutulong sa nas epektibong pagkatuto ng mga mag-aaral, lalo na sa pag-aaral ng tula. Binigyang-diin ang integrasyon ng teknolohiya sa pagtuturo ng panitikan. Sa tulong ng multimedia presentations, video performances ng spoken word poetry, at interaktibong plataporma, napapadali ang pag-unawa ng mga estudyante sa tula at lumalawak ang kanilang perpektiba sa mga kontemporaryong isyu. Bukod dito, isinasaad sa pananaliksik ni Javier, (2021). na “*Makabagong Pamamaraan ng Pagtuturo ng Filipino sa Bagong Kadawyan*”, na ang paggamit ng estratihyang nakasentro sa mag-aaral, tulad at paggamit ng makabuluhang konteksto sa pagtuturo, ay higit na nakaambag sa mas malalim na pagkatuto. Pinatunayang mas makikibahagi ang mga estudyante kung ang mga tulang ginamit ay may kaugnayan sa kanilang personal na karanasan at lipunang ginagalawan

Sa kabuuan, ipinapakita sa mga lokal na pag-aaral na ang tula ay nananatiling makapangyarihang kasangkapan sa edukasyon sa kabila ng mabilis na pagbabago sa lipunan. Sa pamamagitan ng mga makabagong pamamaraan at teknolohikal na integrasyon, napapanatiling buhay ang panitikang Filipino bilang susi ng pagkatuto sa kontemporaryong panahon. Isa sa mga layunin ng pag-aaral na ito ay suriin kung paano nagagamit ang tula sa makabagong panahon bilang epektibong kasangkapan sa pagtuturo at pagkatuto, at kung paano ito nakatutulong sa paghubog ng kabataang may malawak na pananaw, makatao, at mapanlikha sa gitna ng mabilis na pagbabago ng lipunan.

Layunin - Ang pag-aaral na ito ay naglalayong suriin ang kahalagahan at epektibong paggamit ng *Tula sa*

Makabagong Panahon: Isang Phenomenolohikal na Pag-aaral sa Karanasan ng mga Guro. Layunin ng pananaliksik na tukuyin ang pananaw ng mga guro sa paggamit ng tula bilang midyum ng edukasyon, pagpapahayag at pag-unawa sa mga kontemporaryong isyung panlipunan. Upang maisakatuparan ang layunin ng pag-aaral, sasagutin ang mga sumusunod na tanong: 1. Ano ang pananaw ng mga guro sa kahalagahan ng tula sa makabagong panahon bilang kasangkapan sa pagkatuto? 2. Paano ginagamit ng mga guro ang tula sa pagtuturo ng mga kontemporaryong isyung panlipunan sa loob ng silid-aralan? 3. Paano tumutugon ang mga mag-aaral sa mga tulang may temang panlipunan sa konteksto ng malabagong teknolohiya? 4. Ano ang mga benepisyong naidudulot ng paggamit ng tula sa pagkatuto ng mga mag-aaral sa kasalukuyang panahon? 5. Ano ang mga hamong kinakaharap ng mga guro bilang midyum ng pagkatuto?

1. Methodology

Ang Pag-aaral ay tungkol sa Tula sa makabagong panahon: Isang Phenomenolohikal na pag-aaral sa karanasan ng mga Guro. Ang disenyo ng pananaliksik na ginamit sa pag-aaral na ito ay kwalitatibong at phenomenological approach. Ang layunin ng pananaliksik ay alamin at unawain ang mga karanasan, pananaw at damdamin ng mga guro hinggil sa paggamit ng tula sa makabagong panahon bilang susi sa pagkatuto sa kontemporaryong panahon. Ang phenomenology ay angkop sa pag-aaral na ito sapagkat nagbibigay ito ng mas malalim na pag-unawa sa mga “lived experiences” ng mga kalahok sa konteksto ng edukasyon at panitikan. Ang mga kalahok sa pag-aaral na ito ay binubuo ng 5 Guro sa parehong antas na nagtuturo ng panitikan. Sila ay pinili gamit ang *purposive sampling*, kung saan ang pagpili ay batay sa kanilang karanasan sa pagtuturo o pag-aaral gamit ang tula bilang midyum sa pagkatuto.

Gumamit ang mananaliksik ng *semi-structured interview guide* upang mangalap ng datos. Ang gabay sa panayam ay naglalaman ng bukas na tanong na tumatalakay sa karanasan ng mga kalahok sa paggamit ng makabagong tula sa silid aralan, mga benepisyong kanilang naranasan, at mga hamong kanilang kinaharap. Ang panayam ay isinagawa ng harapan at/sa pamamagitan ng video call, depende sa abot kayang pamamaraan ng mga kalahok. Lahat ng panayam ay naitala (may paunang pahintulot ng kalahok), at isinalin sa anyong teksto para sa pagsusuri. Ang mga nakalap na datos ay sinuri gamit ang *Thematic Analysis*. Ito ay proseso ng pagbuo ng mga tema mula sa mga salaysay ng mga kalahok. Ang mga hakbang sa pagsusuri ay ang mga sumusunod: 1. pagbasa at muling pagbasa ng mga transkripsyon, 2. Pag-coding ng mga makabuluhang pahayag, 3. Pagsasama-sama ng mga kaugnay na code upang makabuo ng tema, 4. Paglalahad at pagbibigay-kahulugan sa mga tema kaugnay ng layunin ng pananaliksik. Tininyak ng mananaliksik ang *pagkakakilanlan ng mga kalahok ay mananatiling lihim*. Lahat ng impormasyon ay ginamit lamang para sa layunin ng pananaliksik. Inilahad din sa mga kalahok ang layunin ng pag-aaral, at sila ay kusang-loob na sumang-ayon sa pakikilahok sa pamamagitan ng informed consent form.

2. Resulta at Diskasyon

Ito ay naglalaman ng presentasyon, analisis, at interpretasyon ng mga datos na nakalap mula sa mga guro na nagtuturo sa Filipino hinggil sa kanilang karanasan. Obserbasyon, at pananaw sa paggamit ng tula bilang kasangkapan sa pagkatuto sa makabagong panahon. Gamit ang thematic analysis, nauri ng mga kasagutan ayon sa mga sumusunod na temang lumitaw mula sa panayam.

T1: Makabagong Paraan ng paglalahad ng Tula. Ipinapahayag ng mga guro na ang tula ay mas epektibong naihatid sa mga mag-aaral sa pamamagitan ng paggamit ng multimedia gaya ng power point presentations, background music, video clips at spoken word poetry. Ayon kay informant 1: “Inilahad ko ang tula sa mas makabago at interaktibong paraan gamit ang multimedia presentasyon na may kasamang musika, mga larawan at video.” Ganoon din si informant 2 na nagsabing: “Gumamit ako ng background music upang bigyan lalim ang damdamin ng tula at isinabay ko ito sa wastong kumpas ng aking kamay.” Ang paggamit ng teknolohiya ay lumitaw bilang mahalagang elemento sa epektibong paghahatid ng aralin sa tula sa makabagong henerasyon.

T2: Pagtanggap ng Mag-aaral sa Makabagong Anyo ng Tula. Kapansin-pansin ang positibong pagtanggap

ng mga mag-aaral sa makabagong anyo ng tula. Ayon sa mga kalahok, naging mas interesado, masigla, at bukas ang mga mag-aaral sa pagtuklas at paglikha ng sariling tula kapag ito ay ipinamamalas sa kontemporaryong paraan. Sinabi ni Informant 1: *“Mas naging interesado at masigla ang mga mag-aaral...lalo na kung tumatalakay ito sa mga paksang malapit sa kanilang karanasan tulad ng pag-ibig at mga isyung panlipunan,”* Ipinapakita nito na ang pag-uugnay sa kontekstong pangkabataan ay nakatutulong upang mapalalim ang pang-unawa at paglahok ng mga mag-aaral.

T3: Paglinang ng Kritikal na Pag-iisip at Damdamin. Ayon sa mga guro, ang tula ay epektibong kasangkapan sa pagpapaunlad ng kritikal at emosyonal na pag-iisip. Sa pamamagitan ng pagsusuri sa simbolismo, mensahe at talinghaga ng tula, natututo ang mga mag-aaral na magsuri at magpahayag ng sariling pananaw. Ayon kay informant 2: *“Ang tula ay hindi lamang simpleng Porma ng panitikan, kundi isa rin itong Paraan ng malalim na pagninilay.”* Ang tema ng pagsusuri at pagninilay ay pangunahing lumitaw sa lahat ng kasagutan, na nagpapakita ng halaga ng tula bilang daluyan ng malalim na pagkatuto.

T4: Estratehiya sa pagtuturo ng makabagong tula. Ang mga guro ay gumagamit ng iba’t ibang estratehiya upang mapanatili ang interest ng mga mag-aaral. Kabilang dito ang pangkatang pagtatanghal, pag-uugnay sa kontemporaryong isyu, mga malikhaing laro, at aktibong diskurso. Ayon kay Informant 1: *“Pangkatang paggawa ng tula at Pagtatanghal...upang matutong Tumanggap at magbigay ng Makabuluhang komento.”* Ang paggamit ng mga estratehiyang kolaboratibo at makabago ay naglalayong gawing mas personal at makabuluhan ang karanasa ng mga mag-aaral sa tula.

T5: Integrasyon ng Teknolohiya sa pagtuturo ng Tula. Ang teknolohiya ay integral na bahago ng pagtuturo ng tula sa makabagong panahon. Gumamit ang mga guro ng social media. Youtube videos, visual aids, at mobile phones bilang mga kasangkapan sa pagkatuto. Ayon kay informant 4: *“Ginamit namin ang Youtube, Facebook groups, at cellphone recordings bilang Plataporma ng tula.”* Mahalagang tandaan na may ilang mag-aaral na may limitadong access sa internet, kaya’t may alternatibong paraan din tulad ng pagsusulat sa papel o offline recording.

T6: Mga hamon sa makabagong pagtuturo ng tula. Ibinahagi rin ng mga guro ang ilang hamon sa pagtuturo ng tula, kabilang ang kakulangan sa teknolohiya, pasilidad at interest ng mag-aaral. Isa ring hamon ang hiya at takot ng mga mag-aaral na nagbahagi ng kanilang gawa. Ayon kay informant 2: *“Isa sa pangunahing suliranin ay ang Kawalan ng interest ng mga mag-aaral Sa tradisyunal na anyo ng panitikan.”* Gayundin, idinagdag ni informant 3 ang isyu ng bokabularyo bilang sagabal sa mas malalim na pag-unawa sa tula.

T7: Epekto ng tula sa Akademikong Performance at partisipasyon. Inilahad ng mga guro ang mga positibong epekto ng tula sa akademikong pagganap at partisipasyon ng mag-aaral. Tumataas ang kanilang kumpiyansa, kakayahang magsuri, at kasanayan sa wika. Ayon kay informant 5: *“Mas malawak ang bokabularyo, Tumataas ang kumpiyansa, at Mas aktibo sila sa talakayan.”* Ipinapakita nito na ang pag-aaral ng tula ay may inpluwensya hindi lamang sa asignaturang Filipino kundi pati na rin sa pangkalahatang kakayahang pang-akademiko.

Resulta - Mula sa isinagawang panayam sa 5 guro sa tertiary lebel, lumitaw ang mga sumusunod na mahalagang natuklasan:

- Makabagong paraan ng paglalahad ng tula. Ang paggamit ng multimedia, musika, video presentation, at spoken word poetry ay mas nakakatawag-pansin sa mga mag-aaral at nakatutulong upang mas madali nilang maunawaan ang tula.
- Positibong pagtanggap ng mag-aaral. Mas naging bukas at masigasig ang mga mag-aaral sa pag-aaral ng tula. Lalo na kung ang mga ito ay may temang may kaugnayan sa kanilang buhay at karanasan.
- Paglinang ng kritikal at emosyonal na pag-iisip. Ang tula ay nakatutulong sa pagpapalalim ng pag-unawa ng mga mag-aaral sa mga isyung panlipunan at sa sariling damdamin. Nahahasa rin ang kanilang kakayahang magsuri at magpahayag.

- Mabisang Estratehiya sa pagtuturo. Kabilang sa mga estratehiyang ginamit ng mga guro ang malikhaing pangkatang gawain, interaktibong talakayan, at pag-uugnay sa kontemporaryong isyu upang mapanatili ang interest ng mag-aaral.
- Integrasyon ng teknolohiya. Ang teknolohiya ay ginamit bilang daluyan ng pagtuturo ng tula sa pamamagitan ng social media, mga video, presentasyon, at audio recording.
- Mga hamon sa pagtuturo. Ilan sa mga kinakaharap na hamon ay ang kakulangan ng teknolohiya, interest, at kumpyansa ng mag-aaral, gayundin ang pang-unawa sa malalim na bokabularyo.
- Epekto ng tula sa akademikong performance. Lumitaw na may positibong epekto ang paggamit ng tula sa akademikong pagganap, gaya ng pagtaas ng kumpyansa, kasanayan sa pagsusuri, at aktibong partisipasyon sa klase.

3. Kongklusyon at rekomendasyon

Kongklusyon - Batay sa mga natuklasan, maaaring ipagpalagay na ang tula sa makabagong panahon ay isang mabisang midyum ng pagkatuto. Sa paggamit ng makabagong teknolohiya at malikhaing estratehiya, nagiging mas makabuluhan at personal sa mga mag-aaral ang pag-aaral ng tula. Ito ay hindi lamang naglililang ng kanilang kaalaman sa panitikan kundi pati na rin ng kanilang kakayahang mag-isip ng kritikal at magpahayag ng emosyon. Sa kabila ng ilang hamon, nananatiling epektibo ang tula bilang kasangkapan sa edukasyon.

Rekomendasyon - Bilang tugon sa mga natuklasan, ang mga sumusunod na rekomendasyon ay inihahain:

- Pagpapalakas ng pagsasanay para sa mga guro. Maglunsad ng mga seminar-workshop na nakatuon sa paggamit ng teknolohiya at modernong estratehiya sa pagtuturo ng panitikan.
- Pagbuo ng mga materyal na akma sa kabataan. Lumikha ng mga akdang tula na tumatalakay sa kontemporaryong isyu tulad ng mental health, social media, at relasyon upang mapalalim ang koneksyon ng mag-aaral sa aralin.
- Paglaan ng suporta para sa teknolohiya. Dapat maglaan ang mga paaralan ng sapat na kagamitan gaya ng internet, projector, at audio-visual tools upang mas mapadali ang makabagong pagtuturo.
- Pagpapalaganap ng kultura ng pagsulat at pagbigkas ng tula. Hikayatin ang mga mag-aaral na lumikha at magbahagi ng kanilang sariling tula sa pamamagitan ng spoken word poetry contests, online forums, at iba pang malikhaing plataporma.
- Pagtugon sa mga hamon sa klasrum. Magpatupad ng mga suportang interbensyon para sa mga mag-aaral na nahihirapan sa wika o may mababang interest sa panitikan, tulad ng mentoring o personalized learning activities.

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Youth engagement in environmental programs of Barangay San Gabriel and Tampadong, Pamplona, Camarines Sur

Correa, Shene Rose ✉

Central Bicol State University of Agriculture, Philippines (correashenerose@gmail.com)

Quiom, Karen Angela

Meña, Rhea Mae

Ariola, Ruffa Mae

Labilles, Rosechel

Nolasco, Michael N.



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Abstract

The study was conducted in barangay Tampadong and San Gabriel, Pamplona, Camarines Sur. The study aims to (a) determine the existing environmental programs, (b) determine the level of engagement, (c) identify perceived challenges and (d) propose intervention to improve the youth engagement in environmental programs in barangay Tampadong and San Gabriel Pamplona, Camarines Sur. The researcher used qualitative research to explore youth engagement on environmental programs. The researcher conducted an interview to youth representatives from the two barangays. The study found that both barangays have existing environmental programs such as waste segregation, composting or Materials Recovery Facility (MRF), clean-up drives, tree planting, and ordinances against illegal dumping. The level of youth engagement in these environmental programs was interpreted as highly engaged, indicating that youth are aware of environmental initiatives, actively participate in activities, and encourage others to become involved. However, youth participation in environmental decision-making processes was comparatively lower. The study also identified several challenges affecting youth engagement, particularly time constraints, lack of support from leaders or peers, limited accessibility to programs, and misalignment of activities with youth interests. Furthermore, the respondents strongly supported proposed interventions such as organizing youth-focused environmental events, providing incentives, using social media for awareness campaigns, and strengthening collaboration with schools and youth organizations to improve youth participation. The study recommends intensifying information campaigns, demonstrations and household monitoring on proper waste segregation, and provision of incentives for community's compliance. Moreover, creation of youth councils, and youth representatives on environmental committee, and conduct of consultation meetings will

strengthen the sense of ownership on the environmental programs. Further, the barangays should create a comprehensive youth environmental program and utilize media for promotion, recognition and awards and partnership to schools and youth groups.

Keywords: level of engagement, youth engagement, environmental programs, Pasacao, Camarines Sur

Youth engagement in environmental programs of Barangay San Gabriel and Tampadong, Pamplona, Camarines Sur

1. Introduction

Youth is defined as the phase between childhood and adulthood, marked by physical, emotional, and cognitive growth, exploration, and increasing social involvement (World Health Organization [WHO], 2025). Globally, around 1.2 billion people aged 15 to 24 years represent 16% of the total population, making this demographic critical for sustainable development initiatives (World Youth Report, 2020). UNESCO emphasizes that young people are essential partners in driving social change, reducing inequalities, and advancing sustainability, due to their creativity, innovation, and leadership potential. Projections indicate the youth population will rise by 7% to nearly 1.3 billion by 2030. By that time—when the Sustainable Development Goals (SDGs) are expected to be achieved—it is today's youth who will face the outcomes, positive or negative, of current environmental and climate-related decisions (Tabanao et al., 2025).

Engaging youth in community environmental initiatives benefits both young individuals and the communities they belong to. Active participation fosters positive youth development and builds life skills (Pittman et al., 2003; Schusler & Krasny, 2010). Beyond personal growth, these programs address critical local concerns and align strongly with the values and interests of young people (McCullough et al., 2022). Despite this recognized value, significant gaps remain—especially in Barangay San Gabriel, Pamplona, Camarines Sur. Studies show that while participation opportunities have increased, engagement is often tokenistic: youth are included too late in planning, lack meaningful decision-making roles, and have limited platforms to contribute. Weak communication, insufficient resources, lack of mentorship, and poor institutional support further limit empowerment. There is also limited evidence regarding which non-formal engagement models work best and what features drive success. Resolving these requires inclusive involvement from the early stages, better communication strategies, and rigorous evaluation of engagement approaches.

Worldwide, youth are increasingly recognized as central actors in climate and environmental action. According to the Geneva Environment Network (2024), young people consistently demonstrate capacity to develop innovative solutions and advocate effectively. Their participation in campaigns, policy dialogues, and local programs shows growing commitment to environmental stewardship. International research supports this: Sarkar (2023) noted that successful youth-led initiatives rely heavily on intergenerational cooperation and knowledge sharing, while More (2024) highlighted how youth activists raise awareness, shape policies, and mobilize communities through education and advocacy. Variations in engagement patterns exist globally. In Canada, for example, youth aged 15-30 volunteered as often as older adults but contributed more hours and a larger share of donations. In 2019, 58% of millennials and 55% of Gen Z used sustainable transport more often; 64% of millennials reduced single-use plastics and recycled more than Gen Z (55%). Additionally, 62% believed Canada should lead climate action, and 65% of those aged 18-34 were willing to pay extra annually for climate protection, compared to 38% of adults aged 55+ (Arriagada & Pinault, 2022).

Structured, well-designed approaches are key to meaningful engagement. Hickman (2016), through the Youth Leading Environmental Change project, proposed a theory explaining how youth drive cultural shifts toward sustainability when given proper support and platforms. Reimer and Lynes (2015) argued that engagement must be strategic—with clear activities, motivation strategies, and measurable outcomes. In Southeast Asia, involvement in sustainability programs correlates with stronger community ties and better environmental behaviors. A Malaysian study by Hanifah (2021) found that participation in waste management, energy conservation, and sustainable purchasing significantly improved pro-environmental practices.

Local studies reflect growing environmental awareness among Filipino youth, yet many still face barriers:

limited information, lack of environmental education, weak community support, and minimal decision-making roles. These findings align with Cardarelli (2021), who emphasized that authentic engagement requires not only opportunities but also mentorship, resources, and empowerment-focused frameworks.

This study focuses on Barangay San Gabriel (population 3,928) and Barangay Tampadong (population 1,645), Pamplona, Camarines Sur—areas already implementing tree planting, clean-up drives, and waste management programs, but with unmeasured levels of youth involvement. Both barangays have a large youth population whose participation could greatly advance local sustainability goals. Drawing from international and local literature, this research provides a foundation to analyze current engagement and develop better interventions. Specifically, the study aims to identify existing programs, assess engagement levels, determine challenges, and propose improvements. It affirms that youth engagement benefits environmental outcomes, empowers individuals, promotes sustainable habits, and builds resilient communities.

Statement of the Problem - This research seeks to answer the following questions:

- What are the existing environmental programs in Barangay Tampadong and San Gabriel, Pamplona, Camarines Sur?
- What is the level of engagement of youth from these barangays in environmental programs?
- What perceived challenges hinder youth engagement in such programs?
- What interventions can be proposed to improve participation?

Objectives of the Study - The general objective is to assess existing programs and youth engagement. Specifically:

- Identify the environmental programs currently implemented.
- Determine the level of youth engagement.
- Describe the perceived challenges affecting participation.
- Develop an intervention plan to enhance youth involvement.

Significance of the Study - This research highlights the role of youth in environmental protection and sustainability. Its findings will benefit the following:

- Researchers: Deepens understanding of youth participation and strengthens skills in research and community work.
- Youth: Raises awareness, builds skills, fosters responsibility, and encourages active participation.
- Local Government Units: Provides data-driven insights to design and improve youth-inclusive programs.
- Environmental Groups: Helps identify effective strategies for conservation and advocacy.
- Academe: Serves as reference material and links theory with real-world application.
- Non-Government Organizations: Offers insights to design empowerment-focused initiatives and partnerships.

Scope and Delimitation - This study covers existing environmental programs, level of engagement, challenges, and proposed interventions in Barangays San Gabriel and Tampadong, over the past ten years. Respondents include 275 youth from San Gabriel (31.43% of 875 youth population) and 214 from Tampadong (46.52% of 460 youth population), aged 15-30 years old as defined by Republic Act 8044. It focuses on activities such as tree planting,

clean-up drives, waste management, and awareness campaigns. It excludes other age groups and communities outside the two barangays.

Theoretical Framework - The study integrates three theories: Youth Empowerment Theory (Zimmerman, 1995), Theory of Planned Behavior (Ajzen, 1991), and Social Cognitive Theory (Bandura, 1986).

- **Youth Empowerment Theory** explains that youth become more engaged when they are given meaningful roles, responsibilities, and opportunities to contribute to community programs. When youth feel valued and empowered by barangay officials and community leaders, their level of participation in environmental programs increases.
- The **Theory of Planned Behavior** explains that youth participation is influenced by their attitude toward environmental programs, the support they receive from others (subjective norms), and their perceived behavioral control. In this study, perceived behavioral control represents the challenges youth experience, such as lack of time, lack of resources, and limited support, which affect their intention to participate.
- **Social Cognitive Theory** further explains that youth engagement is influenced by the interaction between personal factors (such as confidence and environmental awareness), environmental factors (such as barangay support and availability of programs), and behavior (actual participation). Youth who have higher self-efficacy and stronger community support perceive fewer challenges and are more likely to engage in environmental activities.

Together, these explain that engagement is influenced by empowerment, challenge perceptions, and social environment.

1. Methodology

This section describes the methods and procedures used to investigate youth engagement in Barangays San Gabriel and Tampadong. It covers research design, sampling, respondents, instruments, data gathering, and statistical analysis.

Research Design - A qualitative research method was used, supported by quantitative survey data. This approach allowed deep exploration of experiences, processes, and context through observation, document review, and interviews, focusing on understanding rather than controlling variables (Bhandari, 2025).

Sampling Methodology - Stratified random sampling was applied, dividing the population by age, gender, and educational attainment to ensure representation. Random selection was done within each group (Simkus, 2023).

Population and Sample - The population includes all youth aged 15-30 years residing in the two barangays. Sample size was determined as follows:

Table 1
Youth Population and Sample Size

Barangay	Total Youth Population	Percentage	Sample Size
Tampadong	460	34.46%	214
San Gabriel	875	65.54%	275
Total	1,335	100%	489

Note. Source: 2020 Census data; PhilAtlas, 2018.

Research Instrument - A structured questionnaire was developed to gather data on existing programs, engagement levels, challenges, and interventions. A 4-point Likert scale was used: 4 - Strongly Agree 3.00 - 4.00, 3 - Agree 2.00 - 2.99, 2 - Disagree 1.00 - 1.99, and 1 - Strongly Disagree 0.99 - 1.00.

Data Gathering Procedure - Permission was secured from barangay officials, and informed consent was obtained from participants. Questionnaires were distributed personally and retrieved to ensure completeness. Secondary data from barangay records and ordinances were also reviewed. Data were tabulated and analyzed using frequency, percentage, and weighted mean.

Statistical Treatment

- Frequency and Percentage: Describes respondent profile and distribution (Manikandan, 2011; Cuemath, 2023).
- Weighted Mean: Determines levels of engagement, challenges, and interventions (Bhandari, 2023).
- Slovin's Formula: Used to determine sample size with acceptable margin of error (Bobbitt, 2023; Longe, 2025).

2. Results and Discussion

This section presented the results and data collected through the research procedures and methods used in this study. The data were analyzed to come up with the findings needed to answer the specific problems identified.

2.1 Existing Environmental Programs

Table 2
Existing Environmental Programs

Environmental Program	San Gabriel			Tampadong		
	Weighted Mean	Interpretation	Rank	Weighted Mean	Interpretation	Rank
Waste segregation	3.15	Strongly Agree	5	3.05	Strongly Agree	5
Composting or MRF	3.17	Strongly Agree	3.5	3.17	Strongly Agree	1.5
(Materials Recovery Facility)						
Clean up-drives	3.19	Strongly Agree	2	3.14	Strongly Agree	3
Planting Activities	3.17	Strongly Agree	3.5	3.17	Strongly Agree	1.5
Ordinance against littering and illegal dumping	3.29	Strongly Agree	1	3.13	Strongly Agree	4

In San Gabriel, the Ordinance against littering and illegal dumping ranked highest (WM=3.29), while Waste segregation ranked lowest (WM=3.15). In Tampadong, Composting/MRF and Tree planting tied for highest (WM=3.17), and Waste segregation was lowest (WM=3.05). Programs with immediate visible impact, such as clean-up drives, are better implemented and valued, aligning with Social Cognitive Theory—people engage more when they see tangible results (Bandura, 1986). Tree planting, a long-term activity, ranked lower due to inconsistent maintenance and limited resources. These findings agree with Ajzen (1991), who noted that accessible and visible programs generate higher participation.

2.2 Level of Youth Engagement

Table 3
Level of Youth Engagement

Level of Engagement	San Gabriel			Tampadong		
	Weighted Mean	Interpretation	Rank	Weighted Mean	Interpretation	Rank
Actively participate	3.2	Highly engaged	5	3.21	Highly engaged	1.5
Aware of youth-led environmental initiatives	3.19	Highly engaged	2.5	3.21	Highly engaged	1.5
Represented in decision-making	3.18	Highly engaged	4	3.1	Highly engaged	5
Volunteer in program.	3.19	Highly engaged	2.5	13	Highly engaged	4
Encourage peers to join	3.24	Highly engaged	1	3.18	Highly engaged	3

All indicators were rated Highly Engaged. In San Gabriel, Encouraging peers ranked highest (WM=3.24), reflecting leadership and empowerment (Zimmerman, 1995). In Tampadong, Active participation and Awareness ranked highest (WM=3.21). However, Representation in decision-making was lowest in both areas, confirming that participation is mostly operational rather than strategic (Hart, 1992). Differences between barangays reflect varying levels of leadership opportunities and institutional support (Reimer & Lynes, 2015).

2.3 Perceived Challenges

Table 4
Perceived Challenges

Perceived Challenges	San Gabriel			Tampadong		
	Weighted Mean	Interpretation	Rank	Weighted Mean	Interpretation	Rank
Lack of awareness	3.16	Strongly Agree	5	2.64	Agree	3
Time constraints	3.19	Strongly Agree	1.5	2.95	Agree	1
Environmental programs inaccessible	3.18	Strongly Agree	4	2.85	Agree	2
Lack of encouragement or support	3.19	Strongly Agree	1.5	2.8	Agree	5
Programs not aligned with interests	3.19	Strongly Agree	1.5	2.62	Agree	4

In San Gabriel, Time constraints, Lack of support, and Misaligned programs tied as top challenges (WM=3.19). In Tampadong, Time constraints ranked highest (WM=2.95). This aligns with Brodie et al. (2017), who stated that school or work commitments are major barriers. According to Theory of Planned Behavior, lack of perceived control reduces participation intention (Ajzen, 1991). San Gabriel respondents rated all challenges as Strongly Agree, while Tampadong rated them as Agree, likely due to differences in infrastructure and resources (Kollmuss & Agyeman, 2002).

2.4 Proposed Interventions

Table 4
Perceived Challenges

Parameters	San Gabriel			Tampadong		
	Weighted Mean	Interpretation	Rank	Weighted Mean	Interpretation	Rank
Integrate environmental education	3.21	Strongly Agree	3	3.15	Strongly Agree	5
Offer incentives / rewards	3.22	Strongly Agree	2	3.56	Strongly Agree	1
Use social media for promotion	3.18	Strongly Agree	5	3.9	Strongly Agree	3
Organize youth-focused activities	3.26	Strongly Agree	1	3.2	Strongly Agree	4
Collaborate with schools / organizations	3.2	Strongly Agree	4	3.30	Strongly Agree	2

All interventions were highly supported. In San Gabriel, Youth-focused activities ranked highest (WM=3.26), while Tampadong preferred Incentives (WM=3.56). This supports Youth Empowerment Theory—motivation increases when activities match interests and offer recognition (Zimmerman, 1995). School partnerships were also preferred, aligning with Social Cognitive Theory regarding supportive environments and role models (Bandura, 1986).

2. Summary, Conclusion and Recommendation

This section presents the summary, findings, conclusion, and recommendations for the study titled Youth Engagement in Environmental Programs in Barangay San Gabriel and Tampadong, year 2025-2026

Summary - The study titled “Youth Engagement in Environmental Programs of Barangay San Gabriel and Tampadong, Pamplona, Camarines Sur” investigates the extent to which young people participate in barangay-led environmental initiatives, including waste management, cleanup drives, tree planting, and ecological awareness campaigns. The research aims to (1) identify the existing environmental programs in the two barangays, (2) determine the level of youth engagement, (3) examine the perceived challenges affecting their participation, and (4) propose an intervention program to enhance youth involvement. The respondents of the study are youth aged 15 to 30 years old, as defined by Republic Act 8044, residing in Barangay San Gabriel and Barangay Tampadong. Using stratified random sampling, a total of 489 youth respondents were selected: 275 from Barangay San Gabriel (out of 875) and 214 from Barangay Tampadong (out of 460). The study employs a qualitative research design, supported by survey questionnaires on a 4-point Likert scale, along with document reviews and field-based data collection, to obtain in-depth and reliable information about youth participation in local environmental programs.

Conclusion - Both communities run effective environmental programs with visible results, though waste segregation remains poorly practiced and needs stricter enforcement and more education. Youth are active in hands-on work and aware of initiatives, but are rarely involved in planning or decision-making, limiting their participation to operational tasks only. Common barriers such as lack of time, limited access, and insufficient support hinder full engagement; these concerns are felt more strongly in San Gabriel, while responses in Tampadong are more varied. Both barangays agree that innovative, youth-focused approaches—including digital promotion, incentives, and partnerships with schools and youth groups—are key to strengthening participation.

Recommendation

- The barangay officials should intensify information campaigns, demonstrations, and household monitoring on proper waste segregation. Providing color-coded bins, conducting seminars, and offering small incentives for compliance can help increase participation in waste segregation programs.
- The Sangguniang Kabataan (SK) should be strengthened and made more visible by leading environmental campaigns, organizing activities, and serving as role models in stewardship. Furthermore, youth should be provided with meaningful opportunities to participate in planning and decision-making processes to foster a sense of ownership, while social media and digital platforms should be maximized to effectively disseminate information and encourage participation among the tech-savvy youth population.
- Barangays should schedule activities during weekends or after school hours, provide transportation or nearby venues, and assign youth mentors or facilitators. Programs should also be designed based on youth interests, such as using digital platforms, competitions, and creative activities to make participation more appealing.
- The barangays should create a comprehensive youth engagement program that uses social media for promotion, provides recognition and rewards, partners with schools and youth groups, and organizes creative environmental activities such as contests, campaigns, and workshops.

Practical Educational Implications - The findings of this research hold meaningful and actionable implications for various stakeholders involved in environmental governance, youth development, and community sustainability in Barangay San Gabriel and Barangay Tampadong, Pamplona, Camarines Sur.

For barangay officials and local government units, the results serve as a data-driven guide to design, implement, and improve environmental programs that genuinely engage the youth. Recognizing that activities

with immediate, visible outcomes (such as clean-up drives) attract higher participation, while long-term initiatives (like tree planting and waste segregation) face sustainability challenges, authorities can adjust program design—for instance, by adding regular monitoring, recognition systems, and visible impact reporting to encourage sustained involvement. Furthermore, since youth expressed strong interest in incentives, youth-centered activities, and school partnerships, barangay leaders can integrate these elements to make programs more appealing and inclusive. The study also highlights the gap in decision-making involvement; thus, officials can establish formal youth advisory boards or committees to ensure young people are not just participants, but co-planners and decision-makers, leading to more relevant and effective environmental projects.

For the youth sector and youth organizations, this research provides clear insights into their own engagement patterns, challenges, and preferences. It empowers young people to advocate for their needs, propose activities aligned with their interests, and take greater leadership roles in environmental stewardship. Understanding that time constraints and lack of support are major barriers, youth groups can collaborate with schools and workplaces to schedule activities conveniently, while also building peer support networks to sustain participation. The identified interventions—such as eco-contests, digital promotion, and educational activities—can be directly adopted by youth leaders to mobilize more peers and strengthen their contribution to community development.

For schools and educational institutions, the findings emphasize the vital role of formal and non-formal education in boosting youth engagement. Integrating environmental education into the curriculum, organizing school-community environmental projects, and recognizing student participation through awards or credit systems can bridge the gap between learning and action. Schools can also partner with barangays to co-design programs that fit students' schedules and align with their learning goals, helping translate environmental knowledge into actual behavior and community service.

For environmental groups and non-government organizations, this study offers a clear understanding of local barriers and motivations, enabling them to develop targeted capacity-building programs, provide mentorship, and deliver resources to support barangay-led initiatives. They can use the results to craft strategies that address specific challenges—such as accessibility, relevance, and social support—and to replicate successful engagement models in other nearby communities with similar contexts.

Overall, this research provides a practical framework to transform youth engagement from token participation into meaningful, empowered action. By applying the identified strategies, stakeholders can create a more active, capable, and committed youth sector that drives sustainable environmental management, builds climate-resilient communities, and contributes effectively to local and national sustainability goals.

AI Declaration Statement - AI Use Disclosure. The authors used ChatGPT (OpenAI, 2026 version) for language refinement, grammar correction, organization of ideas, and manuscript improvement during the preparation of this study. All outputs generated by the AI tool were carefully reviewed, verified, validated, and edited by the authors. The authors assume full responsibility for the accuracy, integrity, and originality of the final manuscript. No confidential or personally identifiable information was entered into the AI system.

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Kultura ng kape at akademikong pagganap ng mga Kabataang mag-aaral

De Ramon, Natividad L. ✉

Sorsogon State University, Sorsogon, Philippines (deramon.natividad@sorsu.edu.ph)

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Abstract

Ang karamihan sa mga mag-aaral ay nakatuon lamang sa: dami ng iniinom na kape at epekto ng coffaine sa utak o katawan. Ang pagkakaiba nito ay hindi lang “pag-inom” ang tinitingnan kundi ang kultura ng kape-kabilang ang oras ng pag-inom, ang iba ay may dahilan kaya sila nag-iinom ng kape at ang iba ay ginagawang simbolismo-ito yong kape bilang kasama sa pag-aaral. Ngunit ang labis na pag-inom nito ay nagdudulot ng negatibong epekto sa kalusugan at pagkatuto, samantalang ang katamantamang pag-inom ay nakakatulong sa pagiging alerto sa klase. Ang pananaliksik na ito ay ginamitan ng quantitative-correlational research design na naglalayong tukuyin ang ugnayan ng kultura ng kape at akademikong pagganap ng mga kabataang mag-aaral. Ang correlational design ay akma sa pag-aaral ng kabataan dahil ito ay nagbibigay-daan upang makita kung may statistical na kaugnayan ang kape bilang bahagi ng kanilang kulturang popular at kanilang akademikong pagganap. Sa mga natuklasang datos, lumalabas na ang kultura ng kape ay isang karaniwang gawi sa mga kabataang mag-aaral. Marami ang sumasang-ayon na ang pag-inom ng kape ay bahagi ng kanilang pag-aaral, na nakatutulong upang maging alerto, gising at mas handa sa pagganap ng kanilang mga akademikong gawain. Sa naging resulta, malinaw na ang kape ay nakikita bilang praktikal na nakatutulong, lalo na kapag may mga pagsusulit o mabibigat na takdang aralin. Makikita rin na hindi lahat ng mag-aaral ay lubusang naniniwala na ang kape ay direktang nagpapataas ng marka o ng kabuuang pagganap. Ang kape kadalasan, nakikita bilang pansamantalang suporta lamang na nakapagpapalakas ng konsentrasyon ngunit hindi ito garantiya na ang mga mag-aaral ay nakakakuha ng mataas na marka sa pagganap. Lumabas din sa pag-aaral na ang kultura ng kape ay higit pa sa simpleng pag-inom; ito ay nakaugnay sa mga nakikita sa “social media”, at nakikilala ng kabataan bilang mga modernong mag-aaral. Malaking bilang ng mga mag-aaral ang nakaranas ng puyat dahil sa sobrang pag-inom ng kape, na nagdudulot ng negatibong epekto sa pagganap. Ipinakita ng pag-aaral na ang kape ay may magkahalong positibo at negatibong epekto sa mga mag-aaral: para sa positibong epekto ito ay nakakatulong sa mental alertness at focus sa akademikong pagganap ngunit ito ay nagdudulot ng pagkapuyat kapag ito’y nasobrahan. Ang kultura ng kape sa mga mag-aaral ay isang dinamikong bahagi ng pag-aaral kapaki-pakinabang kung wasto, ngunit may panganib kung hindi kontrolado.

Keywords: kape, kultura, kabataan, mag-aaral, akademiko

Kultura ng kape at akademikong pagganap ng mga Kabataang mag-aaral

1. Introduksyon

Sa mga paaralan at pamantasan mapaprebado at pampubliko man ito'y mapupuna ang pagdami ng mga estudyanteng umiinom ng kape, kapansin-pansin na hindi pa nga nagsisimula ang klase kape na agad ang kaharap. Ilan sa mga sagot ng ilang mga nainterbyu ay upang manatiling gising, masigla ang diwa, at nakahanda sa mga gawaing pang-akademiko. Sa kabilang banda, ang kape ay sumisimbolo ng pagkakaisa at karaniwang tinatangkilik lalo na doon sa mga nag-uusap, pagtitipon, at maging sa mga gawaing panggrupo ng mga mag-aaral na nag-aaral ng leksyon o sa tuwing may mga okasyon. Nagbubukas din ito ng mga katanungan hinggil sa epekto ng kulturang sa akademikong pagganap. Habang itinuturing ng ilan na nakatutulong ang kape sa kanilang konsentrasyon at pagiging produktibo, may mga pag-aaral ding nagpapakita ng posibilidad ng negatibong epekto nito sa kalusugan at pangmatagalang atensyon ng mag-aaral. Sa kontekstong ito, mahalagang siyasatin kung paanong ang kultura ng kape ay nakaaapekto, tuwiran man o di-tuwiran, sa pagganap ng mga kabataang mag-aaral sa kanilang akademikong pag-aaral.

Sa iba't ibang dako ng daigdig, ang pag-inom ng kape ay bahagi na ng pang-araw-araw na buhay ng mga mag-aaral. Sa bansang Jordan, lumabas na malaking bahagi ng mga estudyante ang umaasa sa kape tuwing mayroong mga pagsusulit upang manatiling gising at makapokus sa aralin. Bagama't nakatutulong ito sa pansamantalang konsentrasyon, napag-alaman din na ang labis na pag-inom ay nagdudulot ng pagkabawas sa oras ng pagtulog at posibling makaapekto sa pangmatagalang memorya (Al-Sawalha et al., 2020). Sa Korea, isang pag-aaral sa mga medical students ang nagsiwalat na higit sa kalahati ng mga respondente (60.9%) ay umiinom ng coffee upang mapabuti ang kanilang akademikong pagganap. Gayunpaman, marami rin sa kanila ang nakaranas ng mga side effects gaya ng palpitations, anxiety, at indigestion. Ang ganitong kalagayan ay nagpapakita ng trade-off sa pagitan ng pagnanais na maging produktibo at ng panganib sa kalusugan (Kim et al., 2023).

Sa Saudi Arabia, ang Arabic coffee ay hindi lamang inumin kundi bahagi ng kanilang kultura ng pakikipagkapwa. Ipinapakita sa pag-aaral na ito na bagamat nakatutulong ang moderate na pag-inom ng kape sa pagiging alerto, ito rin ay nakapaloob sa mga ugnayang panlipunan at ritwal, na may impluwensya sa lifestyle ng kabataan (Hassan & Alqahtani, 2022). Ipinapakita ng mga Internasyonal na pag-aaral na ang kultura ng pag-inom ng kape sa hanay ng kabataan ay may halong positibo at negatibong implikasyon. Bagamat ito ay karaniwang nakikita bilang kasangkapan upang mapanatili ang gising at fokus sa pag-aaral, wala pa ring malinaw na ebidensya na ito ay direktang nagdudulot ng mataas na akademikong pagganap. Sa halip, mas lumilitaw na ang epekto ng kape ay nakadepende sa dami ng konsumo, kalidad ng pagtulog, pisikal na kalusugan, at konteksto ng kultura at sosyo-ekonomikong kalagayan ng mga mag-aaral.

Sa Pilipinas, may ilang pananaliksik na tumatalakay sa kaugnayan ng pag-inom ng kape at mga gawi sa pag-aaral ng mga kabataan. Sa isinagawang pag-aaral sa Cavite State University-Imus Campus, sinuri ang "*Coffee Consumption & its Perceived Effects on the Study Habits of Higher Education Students*". Gumamit ng survey methods sa 208 na mag-aaral ay lumabas na 76.44% ng mga respondente ang umiinom ng kape araw-araw. Karamihan sa kanila ay umaayon na parehong nakabubuti ang mainit at malamig na uri ng kape sa kanilang pag-aaral. Inilahad din na nakatutulong ang kape sa pagpapabuti ng konsentrasyon, sigla, at pagiging produktibo, gayun din sa pag-taas ng motibasyon at positibong disposisyon ng mga mag-aaral (Abad et al., 2021).

Samantala, isinagawa ang pag-aaral na "*Evaluating the Effects of Coffeinated Coffee Consumption to the Study Habits of Selected Private Senior High School Students in Dasmariñas, Cavite*." saklaw nito ang mga mag-aaral sa tatlong pribadong senior high schools sa lungsod. Ipinapakita ng resulta na naniniwala ang mga mag-aaral na ang kape ay nakatutulong upang mapahusay ang kanilang pagtutok, motibasyon, at kakayahang tapusin ang mga gawaing pang-akademiko sa itinakdang oras. Napag-alaman ding may epekto ito sa pattern ng kanilang

pagtulog, bagaman inilarawan bilang katamtaman at hindi labis na nakakaapekto sa pang-araw-araw na gawain (De Castro et.al., 2019).

Dagdag pa rito, isang pag-aaral mula sa Ateneo de Zamboanga University at University of the Philippines Mindanao ang nagsuri sa epekto ng coffee-based products sa *study routine at quality of rest* ng mga nursing students. Lumalabas na ang mga mag-aaral ay may positibong pananaw hinggil sa kakayahan ng coffee na makatulong sa kanilang pagiging gising at alerto sa pag-aaral, partikular sa panahon ng pagsusulit at gawaing pangkurso. Ipinakita rin ng resulta na neutral ang kanilang pananaw sa epekto ng coffee sa kalidad ng kanilang patulog. Bagaman may kamalayan sila sa mga posibleng panganib ng labis na pag-inom, tulad ng pananakit ng ulo at paghihina, nananatiling bahagi ng kanilang pang-araw-araw na akademikong gawain ang pag-inom ng mga produktong may caffeine (Garcia et. Al., 2020).

Ipinapakita ng mga pambansang pag-aaral na sa konteksto ng Pilipinas, ang pag-inom ng kape ng mga kabataan ay higit na nakikita bilang suporta sa kanilang akademikong gawain. Nakapagdudulot ito ng positibong epekto sa konsentrasyon at produktibidad, ngunit kalakip din ang ilang hamon gaya ng pagbabago sa pattern ng pagtulog at posibleng negatibong epekto sa kalusugan kung ito ay sobra-sobra. Ang pananaliksik na ito ay nakabatay sa ilang umiiral na batas at patakaran sa Pilipinas na naglalayong pangalagaan at paunlarin ang edukasyon, kabataan, at kultura. Una, 1987 Philippine Constitution, Article XIV, Seksyon 1) na tungkulin ng Estado na tiyakin ang isang sistemang pang-edukasyon na makapagpapaunlad sa lahat ng mamamayan. Kaugnay nito, ipinagtibay ng Republic Act No. 9155 (Governance of Basic Education Act of 2001) ang responsibilidad ng mga paaralan na lumikha ng kapaligirang nakapagpapaunlad sa kabuuang pagkatuto ng mga mag-aaral.

Ang pag-aaral na ito ay nakabatay sa Yerkes-Dodson Law (1908) na nagsasaad na may umiiral na *optimal level of arousal* na nakatutulong upang maging mahusay ang pagganap ng tao. Sa konteksto ng pag-aaral ang coffee mula sa kape ay nagsisilbing stimulant na nagpapataas ng antas ng *arousal* ng utak. Sa tamang dami, nakapagpapabuti ito ng atensyon, konsentrasyon, at kakayahang mag-retain ng impormasyon na mahalaga sa akademikong pagganap ng mga mag-aaral. Subalit kapag lumagpas sa optimal level, maaari namang magdulot ng sobrang pagka-alerto na nauuwi sa anxiety at pagbaba ng performance. Kalakip nito, mahalaga ring gamitin ang Information Processing theory nina Atkinson at Shiffrin (1968) na nagpapaliwanag sa proseso ng pagkatuto: mula sa sensory memory patungo sa short-term at long-term memory. Ang pag-inom ng kape ay maaaring makatulong sa mas matagal na atensyon at mas epektibong encoding ng impormasyon, kaya't nagiging mas malinaw at mabilis ang pagkatuto. Ipinapakita ng mga teoryang ito na ang kape, bilang bahagi ng kabataan, ay may potensyal na positibong maka-apekto sa kanilang learning performance kung ito ay iniinom sa katamantamang antas.

Samantala, sa mga lokal na pag-aaral wala pang tukoy na mga pananaliksik para sa Kape at akademikong pagganap lalo na dito sa probinsya ng Sorsogon. Kaya ito ay isang *research gap* na tutugunan ng mananaliksik. Ang pangunahing benepisyaryo ng pag-aaral na ito ay: Una, Kabataang Mag-aaral, bilang pangunahing tagapagtaguyod ng coffee culture at kalahok sa pananaliksik. Pangalawa, Mga edukador at Institusyong Pang-akademiko, na maaaring gamitin ang resulta para sa paghubog ng mga programa sa kabataang pag-unlad, sa wika at kultura. Pangatlo, Local coffee owners, coffee producers, at lokal na pamahalaan upang higit nilang mapa-unlad ang kanilang produksyon. Pang-apat, paggamit sa resulta ng pananaliksik bilang basehan ng mga programang pangkabataan, pangkultura, at pangkabuhayan. Panglima, Pag-ambag sa pambansang adhikain sa dokumentasyon at pagpapaunlad ng kulturang Filipino sa gitna ng makabagong panahon.

Mula sa pag-aaral na ito, maaaring mabuo ang ilang makabuluhang output. Una, isang komprehensibong pananaliksik na papel na magsisilbing sanggunian tungkol sa ugnayan ng kultura ng kape at akademikong pagganap ng mga kabataan. Ikalawa, maaaring makabuti ng policy brief o rekomendasyon para sa mga paaralan hinggil sa tamang regulasyon ng pagbebeenta at pagkonsumo ng kape, ikatlo, seminar at information campaign sa pamamagitan ng poster o leaflets upang maipalam ang epekto ng kape sa kalusugan at pag-aaral. Panghuli, integrasyon sa kurikulum at extension program na layong itaguyod ang balanseng pamumuhay at mas mataas na akademikong pagganap ng mga kabataang mag-aaral.

Layunin - Ang pananaliksik na ito ay naglalayong alamin ang unayan ng kape at akademikong pagganap ng mga kabataang mag-aaral ng Sorsogon State University: **Una**, ano ang demograpikong profyl ng mga respondente batay sa: a) Kasarian b) Edad c) Antas ng edukasyon d) Kurso/Strand e) Average na grado sa huling semestre o grading period **Pangalawa**, Ano ang antas ng kultura ng kape ng mga kabataang mag-aaral batay sa: a) konsumo at gawi sa pag-inom ng kape **Pangatlo**, Ano ang antas ng akademikong pagganap ng mga kabataang mag-aaral batay sa kanilang pananaw? **Pang-apat**, May kabuluhang ugnayan ba ang kultura ng kape at akademikong pagganap ng mga kabataang mag-aaral. **Panglima**, Ano ang implikasyon ng kultura ng kape sa akademikong pagganap ng mga kabataang mag-aaral at ano ang mga rekomendasyon para sa mas epektibong paggamit nito sa pag-aaral?

2. Metodo

Disenyo ng pananaliksik - Ang pananaliksik na ito ay ginamit ang *quantitative-correlational research design* nanaglalayong tukuyin ang ugnayan ng *kultura ng kape* at *akademikong pagganap* ng mga kabataang mag-aaral. Pinili ang ganitong disenyo sapagkat nais ng mananaliksik na suriin ang natural na relasyon ng dalawang variables nang hindi binabago ang kanilang kalagayan sa tunay na kapaligiran. Ang correlational design ay akma sa pag-aaral ng kabataan dahil ito ay nagbibigay-daan upang makita kung may statistical na kaugnayan ang kape bilang bahagi ng kanilang kulturang popular at kanilang academic performance. Ang mga respondente ng pag-aaral ay mga kabataang mag-aaral ng Sorsogon State University, mula sa undergraduate students, 29 BTVTED 2A, 46 BSED Filipino 1A at 3A, 37 BEED 1A, 30 BSHM 4H. Gumamit ng purposive sampling upang piliin lamang ang mga estudyanteng aktibo sa pag-aaral at umiinom ng kape, kahit paminsan-minsan. Ang inaasahang respondente ay 142 upang matiyak ang sapat na datos para sa statistical analysis.

Paraan ng pagkalap ng Datos - Gagamitin ang mga sumusunod na proseso para sa pangangalap ng datos. Una, ipapaalam sa mga respondente ang layunin ng pag-aaral at ang kanilang karapatan sa confidentiality at voluntary patisipasyon. Pangalawa, ipamimigay ang talatanungan sa pamamagitan ng printed forms at bibigyan ng 10-30 minuto para sagutin ang bawat tanong. Pangatlo, kolektahin at susuriin ang mga talatanungan upang matiyak ang kumpletong datos. Pang-apat, I-encode ang mga sagot sa excel o SPSS, gamit ang coding scheme: 4=LSA, 3=LSA, 2=HAS, 1LHSA.

Pamamaraan ng pagsusuri ng datos - Descriptive statistics: frequency at percentage, ito ay gagamitin upang ilarawan ang demographic profile ng mga respondente. gagamitin ang weighted mean upang matukoy ang antas ng kultura ng kape at akademikong pagganap. Inferential statistics: Pearson correlation coefficient (r) ito ay gagamitin upang suriin kung may ugnayan ang kultura ng kape at akademikong pagganap. At gagamitin din ang signifinace level: $p < 0.05$

Ethical consideration - Sisiguraduhin ang confidentiality at anonymity ng mga respondente. Ang partisipasyon ay boluntaryo, at may karapatang huminto anumang oras. Ang lahat ng datos ay gagamitin lamang para sa akademikong layunin.

Research instrument - Ginamit ng mananaliksik ang isang *structured questionnaire* na nahati sa apat na bahagi: una, demographic profile na kung saan ito ay kinabibilangan ng kasarian, edad, antas ng edukasyon, kurso, at average grade sa huling semestre o grading period. Pangalawa, kultura ng kape na susuriin ang konsumo at gawi sa pag-inom ng kape, pati na rin ang kahalagahan nito bilang bahagi ng kulturang popular. Pangatlo, Akademikong pagganap kung saan tinutukoy ang pananaw ng mga estudyante sa epekto ng kape sa kanilang pag-aaral. Pang-apat, naglalayong makuha ang personal na pananaw ng respondente hinggil sa epekto ng kape sa pag-aaral at posibleng rekomendasyon. Upang matiyak ang validity at reliability ng instrumento, ito ay susuriin muna ng eksperto sa edukasyon at kulturang popular at isasailalim sa pilot testing sa 20- 30 mag-aaral bago opisyal na ipamahagi sa target na respondents.

3. Resulta at Diskasyon

Ito ay naglalaman ng presentasyon, analisis, at interpretasyon ng mga datos na nakalap mula sa mga guro na nagtuturo sa Filipino at mga mag-aaral hinggil sa kanilang karanasan. Obserbasyon, at pananaw sa paggamit ng tula bilang kasangkapan sa pagkatuto sa makabagong panahon. Ginamit ang thematic analysis ni Braun at Clarke (2006), nauri ng mga kasagutan ayon sa mga sumusunod na temang lumitaw mula sa panayam.

Talahanayan I

Demographic Profile ng Respondents

Demographic Profile of Respondents			
	Baryabols	Frequency (f)	Percentage (%)
1.Kasarian			
	Lalaki	52	35.14%
	Babae	94	63.51%
	Iba pa	2	1.35%
2.Edad			
	15-17	4	2.68%
	18-20	100	67.11%
	21-pataas	45	30.20%
3.Antas			
	Senior High School	4	2.63%
	Kolihiyo	148	97.37%
4.Kurso/Strand			
	BSED Fil 1A & 3A	46	32.39%
	BTVTED 2A	29	20.42%
	BSHM 4H	30	21.13%
	BEED 1A	37	26.06%
5.Average grades			
	90 pataas	108	71.05%
	85-89	32	21.05%
	80-84	4	2.63%
	79 pababa	0	0%
	No answer	8	5.26%

Ang bahaging ito ng pag-aaral ay naglalahad at naglalarawan sa demograpikong katangian ng mga kabataang mag-aaral na lumahok sa pananaliksik hinggil sa kultura ng pag-inom ng kape at kung paano ito maaaring maiugnay sa kanilang akademikong pagganap. Mahalaga ang impormasyong ito dahil nagbibigay ito ng konteksto sa kanilang mga pag-uugali, gawi, at karanasan sa pag-inom ng kape na maaaring makaapekto sa kanilang performance sa pag-aaral. Sa kabuuang 148 na respondents, ang karamihan ay babae (94 o 63.5%), sinundan ng lalaki (52 o 35.1%), at 2 (1.4%) na nagbigay ng ibang kasarian. Ipinapahiwatag nito na mas Malaki ang bilang ng kababaihang mag-aaral na consumer ng kape at maaaring may natatanging gawi, dahilan, o pananaw sila sa pag-inom ng kape na posibleng makaapekto sa kanilang akademikong pagganap.

Karammihan sa mga respondents ay nasa edad 18-20 taong gulang (100 o 67.6%), habang 45 (30.4%) ang nasa 21 pataas, at 4 (2.7%) ang nasa 15-17. Makabuluhan ito sapagkat ang edad na 18-21 pataas ay karaniwang panahon kung kailan lumalaki ang exposure ng kabataan sa kape, lalo na sa harap ng mabibigat na akademikong gawain, requirements, at puyat. Samakatuwid, ang gawi sap ag-inom ng kape ay maaaring malakas sa grupong ito. Halos lahat ng kalahok ay nasa kolihiyo (148 o 100%), samantalang kakaunti lamang (4 o 2.7%) ang mula sa high school. Dahil dito, makikitang ang pag-aaral ay nakatuon talaga sa ma kabataang nasa mas mataas na antas ng edukasyon-isang grupo na mas madalas ma-stress sa akademikong pangangailangan, kaya mas posibleng umasa sa kape bilang pantulong sa konsentrasyon at pagpupuyat.

Pinakamaraming respondente ay mula sa BSED Fil. 1A at 3A (46 o 31.1%), sinundan n BEED 1A (37 o 25%), BSHM 4H (30 o 20.3%), at BTVTED 2A (2 o 1.6%). Ang iba't ibang kinabibilangang kurso ay nagpapakita na malawak ang representasyon ng mga mag-aaral mula sa larangan ng edukasyon, bokasyonal, at hospitality management. Maaaring mag-iiba rin ang kanilang kultura ng pag-inom ng kape batay sa academic workload, klase ng schedule, at pang-araw-araw na gawain. Karamihan sa mga mag-aaral ay may mataas na akademikong performance: 108 (73%) ang may grading 90 pataas, 32 (21.6%) ang nasa 85-89, 4(2.7%) ang nasa 80-84, 0 ang

79 pababa, at 8(5.4%) ang hindi nagbigay ng sagot. Ipinapahiwatig nito na ang mga kalahok ay masasabing mataas ang antas ng akademikong pagganap. Kaugnay ng pag-aaral, nagbibigay ito ng mahalagang pananaw kung ang pag-inom ng kape ay isang nakatutulong na gawi upang mapanatili ang mataas na performance, o kung ito ay isang coping mechanism lamang na dulot ng mabigat nap ag-aaral.

Talahanayan II

Kultura ng Kape

Pahayag	4-LSA	3-SA	2-HSA	1-LHSA
<i>Konsumo at gawi sapag-inom ng kape</i>				
1. Madalas akong uminom ng kape bago o habang nag-aaral.	32	46	37	38
2. Mas gusto kong uminom ng kape kaysa ibang inumin.	29	39	41	44
3. Hindi kompleto ang aking araw sa pag-aaral kung walang kape.	26	31	49	48
4. Mas napipilitan ako mag-inom ng kape kapag malapit na ang pagsusulit	16	43	45	48
<i>Kape bilang bahagi ng kulturang popular.</i>				
1. Ang kape ay itinuturing kong nakakatulong sa aking pag-aaral.	23	71	38	21
2. Ang coffee shops ay nagsisilbing lugar hindi lamang para sa inumin kundi para sa social life at pag-aaral.	51	77	19	5
3. Nakakaimpluwensiya ang social media sa aking pagtingin sa kape.	25	57	46	25
4. Ang pag-inom ng kape ay bahagi ng aking pagkakakilanlan bilang estudyante.	17	49	48	37

Batay sa mga sagot, makikitang karaniwan ngunit hindi ganap na dominante ang gawi ng regular na pag-inom ng kape sa mga mag-aaral. Marami an sumasang-ayon na umiinom sila ng kape bago o habang nag-aaral, na nagpapahiwatig na ginagamit nila ang kape bilang pantulong sa konsentrasyon at pagpapanatili ng gising sa panahon ng pag-aaral. Gayunpaman, makikita rin na may malaking bilang ng mag-aaral na hindi masyadong umaasa sa kape, gaya ng ipinapakita ng mataas na bilang ng hindi gaanong sumasang-ayon at lubos na hindi sumasang-ayon sa ilang pahaya. Ipinapahiwatig nito na ang kape ay hindi pa rin lubusan naka-ugat sa pang-araw-araw na study routine ng lahat, at maaaring ang pag-inom nito ay situational lamang-halimbawa ay kapag pagod, puyat, o malapit na ang pagsusulit. Nangangahulugan ito na ang kape ay hindi pa rin tinitingnan bilan isan “necessity” bagkus ay isan optional study aid na ginaamit depende sa pangangailangan o ritmong akademiko ng mag-aaral.

Sa ikalawang bahagi, malinaw na ipinapakita ng datos na ang kultura ng kape ay may malakas na presensya sa social at academic lifestyle ng kabataang mag-aaral. Karamihan ay naniwalang nakakatulong ang kape upang ganahan silang mag-aral. Mas kapansin-pansin pa, ang mga coffee shop ay itinuturing na hindi lamang simpleng lugar para bumili ng inumin, kundi isang espasyo para sap ag-aaral, social interaksyon, group work, at pagpapahinga. Makikita rin na Malaki ang impluwensiya ng social media sa pagbuo ng imahe ng kape sa kabataan. Dahil dito, nagiging bahagi ang kape ng kanilang modern student identity, kun saan ang pagpunta sa coffee shops, pag-order ng trending drinks, at pagpo-post ng mga litrato ng “study setup” ay nagiging bahagi ng kanilang online at social lifestyle.

Gayunpaman, hindi pa rin ganap na sinasabi ng lahat ng mag-aaral na ang kape ay bahagi na ng kanilang pagkakakilanlan bilang estudyante, na nangangahulugang may iba pa ring mag-aaral na hindi nakikilahok sa “coffee-centered student culture.” Sa kabuuan, ipinahihiwatig ng Talahanayan II na ang kultura ng kape sa mga kabataang mag-aaral ay: malawak ngunit hindi pare-pareho-marami ang nakikibahagi ngunit hindi lahat ay heavy coffee drinkers. Functional at motivational-ginagamit bilang pampakonsentra, pampagising, at pampagana sap ag-aaral. Malakas ang impluwensiya ng social media at coffee shop culture-nagiging bahagi ng social at academic routine. Hindi parin ganap na identity marker para sa lahat, ngunit Malaki na ang papel nito sa modernong buhay ng mga estudyante. Ipinapakita ng mga result ana an kape ay hindi na lamang isang inumin; ito ay nagiging simbolo

ng lifestyle, productivity, at community sa mga kabataan ngayon.

Talahanayan III

Akademikong pagganap

Pahayag	4-LSA	3-SA	2-HSA	1-LHSA
1. Ang pag-inom ng kape ay nakatutulong sa aking pagiging alerto at gising sa klase.	60	53	29	31
2. Nakatutulong ang kape upang makapag-pokus ako sa pag-aaral.	17	53	51	32
3. Dahil sa kape, mas napapahaba ko ang oras ng pagbabasa at paggawa ng takdang-aralin	28	51	42	32
4. Kapag umiinom ako ng kape, mas mataas ang aking tsansa na makapasa o makakuha ng mataas na marka.	5	32	65	38
5. Ang sobrang kape ay minsan nagdudulot ng puyat at pagbaba ng aking performance.	24	47	52	24
6. Ang kape ay may direktang epekto sa aking pangkalahatang akademikong pagganap.	8	52	58	30
TOTAL	341	701	620	453

Ipinapakita ng resulta na may bahagyang positong epekto ang kape sa pagganap ng mga kabataang mag-aaral, ngunit hindi ito itinuturing na pangunahing salik ng mataas na marka. Karamihan sa mga mag-aaral ay naniniwalang nakatutulong ang kape upang maging alerto, magising, at magkaroon ng higit na focus, gayundin upang mapahaba ang oras ng pagbabasa at paggawa ng gawain. Gayunpaman, hindi gaanong kumbinsido ang mga mag-aaral na ang pag-inom ng kape ay direktang nagpapataas ng marka o ng pangkalahatang akademikong pagganap. Malinaw ding lumitaw na kapag sumobra ang pag-inom ng kape, ito ay magdudulot ng puyat, pagod, at pagbaba ng performance. Sa kabuuan, ang kape ay nakikita bilang pansamantalang tulong sap ag-aaral-nakapagpapagising at nakakatulong sa ilang gawain ngunit hindi garantiya ng mas mataas na akademikong tagumpay, lalo na kung hindi wasto ang paggamit nito.

4. Pananaw tungkol sa Kape

Batay sa mga nakalap na tugon, lumilitaw ang ilang mahalagang pananaw ng mga respondent hinggil sa kanilang pag-inom ng kape. Marami sa kanila ang naniniwala na ang kape ay isang mabisang pampagising at pampalakas ng konsentrasyon, lalo na kapag may mga gawaing pang-akademiko. Ayon sa ilang mag-aaral, mas nagiging alerto sila at mas napapahaba ang oras ng kanilang pag-aaral kapag umiinom sila ng kape. Para sa kanila, ang kape ay nagsisilbing “kaagapay” sa paggawa ng takdang-aralin at paghahanda para sa pagsusulit. May ilan ding nagsabi na ang kape ay hindi lamang inumin, kundi bahagi na ng kanilang pang-araw-araw na routine bilang estudyante. Ang pag-inom nito bao magklase o habang nagrereview ay nakikita nilang bahagi na ng kanilang identity at study habits. Dagdag pa, ilang respondent ang nagsabing naiimpluwensiyahan sila ng social media at ng coffee shop culture, na nagiging dahilan upang mas maging pamilyar at mas ma-enganyo sila sap ag-inom ng kape. Gayunman, may mga respondent ding umamin na ang labis nap ag-inom ng kape ay minsan nagdudulot ng puyat, pagod, at hirap sa pagtulo na posibleng maaapekto sa kanilang performance sa kalaunan, kahit nakatutulong ito sa ilan sitwasyon, sinasabi nilang hindi dapat umasa nang lubos sa kape bilang solusyon sa problema sa oras, pagod, o stress. Sa kabuuan, makikita na ang pag-inom ng kape ay may halo-halong pananaw mula sa mga mag-aaral nakikita ito bilang tulong sap ag-aaral, bahagi ng kultura ng kabataan, ngunit may kaakibat ding panganib kapag hindi wasto ang paggamit.

Implekasyon ng kultura ng Kape - Ipinapakita ng pag-aaral na ang kultura ng kape ay may makabuluhang implikasyon sap ag-aaral at pang-araw-araw na gawain ng mga kabataang mag-aaral. Una, ang kape ay nagiging pansamantalang tulong upang mapataas, ang antas ng alertness, focus, at motibasyon, lalo na sa mga sitwasyong may mabibigat na gawain o paparating na pagsusulit. Dahil dito, nagiging bahagi ang kape ng kaniyang study habits at nag-aambag sa mas epektibong pagtuon sa akademikong gawain. Ikalawa, ang malawak na impluwensya ng social media at coffee shop culture ay nagpapakita na ang kape ay hindi lamang inumin, kundi bahagi ng social identity ng kabataan. Nagiging simbolo ito ng pagiging masipag, produktibo, at nakikiayon sa modernong lifestyle,

na maaaring magtulak sa iba na sumunod sa parehong gawi. Sa kabuuan, ang kultura ng kape ay may positibo at neatibong implikasyon sa mga mag-aaral nanakatulong ito sap ag-aaral ngunit may mga limitasyon at panganib kapag hindi wasto ang paggamit.

5. Kongklusyon at rekomendasyon

Batay sa mga natuklasang datos, lumalabas na ang kultura ng kape ay isang karaniwang gawi sa mga kabataang mag-aaral. Marami sa kanila ang sumasang-ayon na ang pag-inom ng kape ay bahagi ng kanilang pag-aaral, na nakatutulong upang sila ay maging alerto, gising at mas handa sa pagganap ng kanilang mga akademikong gawain. Mula sa resulta, malinaw na ang kape ay nakikita bilang praktikal na tulong, lalo na kapag may mga pagsusulit o mabibigat na takdang aralin. Makikita rin na hindi lahat ng mag-aaral ay lubusang naniniwala na ang kape ay direktang nagpapataas ng marka o ng kabuuang akademikong pagganap. Kadalasan, nakikita nila ito bilang pansamantalang suporta lamang na nakapapalakas ng konsentrsyon ngunit hindi garantiya ng mataas na performance. Lumalabas din sa datos na ang kultura ng kape ay higit pa sa simpleng pag-inom; ito ay nakaugnay sa social media, coffe shop culture, at identity ng kabataan bilang mga modernong mag-aaral. May malaking bilang ng mga estudyanteng nakaranas ng puyat at pagod dahil sa sobrang pag-inom, na nagdudulot naman ng negatibong epekto sa kanilang performance. Ipinapakita ng pag-aaral na ang kape ay may magkahalong positibo at negatibong epekto sa mga mag-aaral: para sa positibong epekto ito ay nakakatulong sa mental alertness at focus ngunit maaaring magdulot ng puyat at pagbaba ng performance kapag nasobrahan. Samakatuwid, ang kultura ng kape sa mga mag-aaral ay isang dinamikong bahagi ng kanilang pag-aaral kapaki-pakinabang kung wasto, ngunit may panganib kung hindi kontrolado.

Rekomedasyon - Narito ang ilang mga rekomendasyon: 1) Magbigay ng alternatibong paraan para mapanatili ang alertness at focus. Dahil hindi lahat ay umaasa lamang sa kape, maaaring hikayatin ang mga mag-aaral na gumamit din ng ibang healthy strategies tulad ng sapat na tulog, tamang oras ng paghinga, at organisadong study schedule. 2) Maglunsad ng maikling orientation o information drive tungkol sa caffeine consumption. 3) Kilalanin at gamitin ang coffee shop study culture bilang oportunidad sap ag-aaral. 4) Bigyan-diin na ang kape ay suporta lamang, hindi solusyon. 5) Para sa mga susunod na mananaliksik: inirerekomenda ang pagsasagawa ng mas malaim na pagsusuri, gaya ng interview at paghahambing ng light to moderate, at heavy coffee drinkers upang mas makita ang tunay na epekto ng kape sa performance.

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Educational priorities from the lens of school leaders: Shaping NEUST-COED extension programs for General Natividad District, Nueva Ecija

Ilumin, Reynaldo J.

Nueva Ecija University of Science and Technology, Philippines

De Guzman, Donna D. ✉

Nueva Ecija University of Science and Technology, Philippines (donnaddeguzman@gmail.com)



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Abstract

This study aimed to identify the priority areas for NEUST-COED extension programs based on the assessed needs of school heads in the General Natividad District, Nueva Ecija. Utilizing a descriptive research design, data were collected from principals and head teachers through a structured online survey. The study was anchored on Sustainable Development Goal 4 (Quality Education), the ARAL Program, and relevant DepEd orders promoting inclusive and equitable education. Results revealed high to very high levels of need in key domains: early literacy instruction, family engagement, reading remediation, inclusive education, and mental health support. Specifically, there is a strong demand for capacity-building on foundational reading skills, contextualized literacy materials, and intervention strategies for learners with disabilities. School heads also emphasized the importance of psychosocial support and social-emotional learning for both teachers and students. These findings highlight the necessity of designing localized, responsive, and sustainable extension programs tailored to the diverse needs of schools. The study recommends a collaborative approach between NEUST-COED and local education stakeholders to implement targeted interventions. Addressing these priority areas is crucial to strengthening basic education outcomes, promoting inclusive practices, and supporting the holistic development of learners in the district.

Keywords: literacy development, inclusive education, psychosocial support, extension programs, school leadership

Educational priorities from the lens of school leaders: Shaping NEUST-COED extension programs for General Natividad District, Nueva Ecija

1. Introduction

Achieving Sustainable Development Goal 4 (Quality Education) is a vital foundation for national development, particularly in the Philippine context. The Department of Education (DepEd) advances this goal through major policy initiatives such as the Learning Recovery and Continuity Plan (DepEd Order No. 13, s. 2023), the MATATAG Curriculum, and the ARAL Program (Access, Reform, and Accelerate Learning). These reforms collectively underscore the importance of foundational literacy, inclusive practices, and learner well-being as key components of quality basic education. These are supported by national legislation, including Republic Act No. 10533 or the Enhanced Basic Education Act of 2013, and Republic Act No. 11650, which both affirm the state's responsibility to ensure equitable learning opportunities for all, especially for marginalized and vulnerable learners.

Despite these progressive reforms, schools continue to grapple with persistent learning gaps, inconsistent access to quality instruction, and limited support for learners with diverse needs. School leaders and teachers face daily challenges in strengthening reading comprehension, numeracy skills, and inclusive classroom practices—especially in resource-constrained contexts. Addressing these gaps requires a deeper understanding of the ground-level realities that educators encounter, including the specific needs of learners across different grade levels and learner groups.

As a teacher education institution, the Nueva Ecija University of Science and Technology College of Education (NEUST-COED) recognizes its vital role in supporting DepEd schools through research-based and needs-responsive extension programs. It is both fitting and imperative for institutions like NEUST-COED to lend a helping hand to public school teachers and learners, particularly in the areas of literacy development, inclusive education, and psychosocial support. In this light, the present study was conducted to explore the educational priorities of school heads in the General Natividad District, Nueva Ecija, with the ultimate goal of shaping relevant and sustainable extension initiatives aligned with the most pressing needs of the schools they serve.

Statement of the Problem - This study aims to identify the educational priorities of school leaders in the General Natividad District in order to guide the development of NEUST-COED's extension programs. Specifically, it seeks to answer the following questions:

- What is the profile of the respondents in terms of position/designation?
- How do school heads describe the educational needs of teachers handling primary-level learners?
- How do school heads assess the professional development needs of teachers handling intermediate-level learners?
- What priority areas may be identified from school heads' perspectives to guide the design of NEUST-COED extension programs that support teachers

2. Methodology

Research Design - This study employed a descriptive survey research design to gather data on the educational priorities as perceived by school leaders in the General Mamerto Natividad District, Nueva Ecija. The design was appropriate for obtaining quantitative and qualitative insights into current needs related to literacy, inclusion, and psychosocial support, thereby guiding the development of relevant extension programs.

Research Locale - The study was conducted in the municipality of General Mamerto Natividad, located in

Nueva Ecija, Philippines. The respondents were public school heads including principals and head teachers within the Department of Education (DepEd) schools in the district.

Instrumentation - The primary data-gathering tool was a structured survey questionnaire designed by the researchers, based on key indicators of educational needs aligned with DepEd priorities and inclusive education frameworks. The instrument included sections on literacy gaps, inclusive practices, support for learners with special needs, and psychosocial support. The questionnaire was reviewed by education experts for content validity and clarity before distribution.

Data Collection Procedure and Ethical Considerations - Data were collected through an online survey using Google Forms. The link to the questionnaire was sent to the official emails or online communication channels of the participating school heads. Prior to participation, respondents were informed of the study's purpose, assured of the confidentiality of their responses, and provided with a consent form. Participation was voluntary, and no personally identifiable information was collected, ensuring adherence to ethical research standards.

Mode of Analysis - The responses were tabulated and analyzed using descriptive statistics. Mean scores were computed to determine the central tendencies of responses, while percentages were used to describe the distribution of categorical data. The results were interpreted with verbal descriptions to highlight key patterns and inform practical recommendations for NEUST-COED's extension initiatives.

3. Results and discussion

Table 1

Position/Designation of Respondents

Position/Designation	Frequency	Percentage
Head Teacher III	4	20.00%
Principal I	7	35.00%
Principal II	8	40.00%
Principal IV	1	5.00%
Total	20	100.00%

A total of 20 school heads participated in the survey. Of these, 40% were Principal II, 35% were Principal I, 20% were Head Teacher III, and 5% were Principal IV. The data show that the majority of respondents were in Principal positions (80%), suggesting a wide representation of school administrators at various levels of school leadership.

Table 2

Educational Needs of Teachers Handling Primary-level Learners

Area of Need	Mean	Verbal Interpretation
Teaching phonological awareness, letter-sound correspondence, and decoding	4.00	High Need
Teaching beginning reading skills in K to 2 learners	4.00	High Need
Providing early reading intervention for at-risk pupils	3.75	High Need
Using storytelling, big books, and shared reading techniques	3.63	High Need
Incorporating songs, rhymes, and movement into literacy	3.63	High Need
Strengthening parent-teacher communication and collaboration	4.00	High Need
Partnering with barangays for early learning programs	4.13	High Need
Empowering parents to support holistic child development	4.25	Very High Need
Promoting fine and gross motor skills in daily routines	3.50	Moderate Need
Designing active play and movement-based lessons	3.50	Moderate Need
Screening for motor coordination or physical developmental delays	3.75	High Need
Providing materials that encourage grip, balance, and strength	3.38	Moderate Need

The findings revealed that school heads in the General Mamerto Natividad District perceived consistently **high to very high needs** in key areas of early literacy and child development for primary-level learners. Notably, the highest-rated item was *empowering parents to support holistic child development* ($M = 4.25$), emphasizing the school leaders' recognition of the home environment's vital role in foundational learning. This aligns with Bronfenbrenner's Ecological Systems Theory, which underscores the importance of the microsystem particularly the family in shaping a child's cognitive and emotional development (Bronfenbrenner, 1979). Similarly, research

by Epstein (2001) advocates for strong school-family partnerships to enhance early learning outcomes, especially in marginalized communities.

High mean scores were also observed in items related to *teaching phonological awareness, letter-sound correspondence, and beginning reading* ($M = 4.00$), reinforcing the importance of early literacy as the cornerstone of lifelong learning. According to the Department of Education's "Every Child a Reader" Program (DepEd Order No. 14, s. 2016), these skills are foundational for reading fluency and comprehension, particularly in K to 3 learners. UNESCO (2016) also highlights that delays in acquiring decoding and reading readiness skills in the early grades are difficult to remediate in later years, reinforcing the urgent need for interventions at this stage.

The moderately rated areas, particularly those concerning **fine and gross motor development** (e.g., *providing materials that encourage grip, balance, and strength*, $M = 3.38$), may indicate a relative gap in awareness or emphasis among school leaders. However, the Philippine Early Childhood Care and Development (ECCD) framework recognizes physical development as a key domain alongside cognitive and socio-emotional skills (Council for the Welfare of Children, 2011). Developmentally appropriate practices, including movement-based learning and active play, support not only motor coordination but also attention, memory, and self-regulation (Tominey & McClelland, 2011).

Finally, items such as *partnering with barangays for early learning programs* and *strengthening parent-teacher communication* received high ratings, which reflects a broader understanding of the need for **community-based and intersectoral approaches** to early education. As suggested by Bautista and Tan (2018), sustainable early learning initiatives in the Philippines thrive best when there is active collaboration among schools, families, and local stakeholders.

Table 2
Educational Needs of Teachers Handling Intermediate-level Learners

Item No.	Area of Need	Mean	Verbal Interpretation
1	Designing effective reading and remediation activities for struggling learners	4.21	Very High Need
2	Conducting reading tutorials and mentoring non-readers in school or community	4.13	High Need
3	Engaging families in home-based literacy support (e.g., read-aloud, vocabulary games)	4.08	High Need
4	Teaching reading comprehension, inferencing, and reflective thinking	4.17	High Need
5	Using real-life and functional literacy tasks (signs, forms, local texts) across subjects	4.00	High Need
6	Diagnosing reading difficulties and designing intervention plans	3.96	High Need
7	Teaching content-area reading in Science, Math, and Araling Panlipunan	3.88	High Need
8	Developing reading materials and assessments for intermediate and upper grades	4.00	High Need
9	Additional community-based learning spaces to support remediation (literacy and numeracy)	4.08	High Need
10	Collaboration with barangays to set up learning hubs for children	4.00	High Need
11	Supporting transition from MTB-MLE to Filipino in Grade 3	3.92	High Need
12	Training in scaffolding reading and writing in Filipino	4.04	High Need
13	Creating contextualized Filipino reading materials	3.96	High Need
14	Conducting Filipino creative writing workshops for learners	4.08	High Need
15	Providing classroom-based social and emotional learning (SEL) integration strategies	4.13	High Need
16	Conducting mental health first aid training for teachers	4.00	High Need
17	Delivering wellness programs and debriefing sessions for teachers	3.88	High Need
18	Running parenting workshops on resilience and emotional regulation	3.92	High Need
19	Promoting anti-bullying and peer support systems	4.13	High Need
20	Facilitating classroom guidance activities appropriate for elementary pupils (e.g., self-awareness, kindness, career dreams)	4.25	Very High Need
21	Coordinating with school guidance staff for referrals and emotional support	3.92	High Need
22	Designing and implementation of a school-wide guidance program (e.g., career week, mental health month, child protection campaigns)	3.88	High Need

The results reveal that the school heads perceived a **very high need** in "Facilitating classroom guidance activities appropriate for elementary pupils (e.g., self-awareness, kindness, career dreams)" ($M = 4.25$),

highlighting the importance of fostering personal and socio-emotional development at the intermediate level. This aligns with the emphasis of **DepEd Order No. 21, s. 2019**, which promotes the integration of life skills, values education, and career awareness even in the early grades. Similarly, “Designing effective reading and remediation activities for struggling learners” ($M = 4.21$), “Teaching reading comprehension, inferencing, and reflective thinking” ($M = 4.17$), and “Promoting anti-bullying and peer support systems” ($M = 4.13$) were rated as high to very high needs. These findings underscore the pressing concern of addressing reading gaps and learner well-being in upper elementary grades. According to Bernardo et al. (2020), struggling readers in the intermediate level require structured, contextualized support to improve fluency and comprehension skills essential for academic success across content areas.

Moreover, school leaders recognized the significance of **mental health and parental engagement**, with high ratings for “Providing classroom-based SEL integration strategies” ($M = 4.13$), “Conducting mental health first aid training for teachers” ($M = 4.00$), and “Running parenting workshops on resilience and emotional regulation” ($M = 3.92$). This mirrors the growing recognition of emotional wellness as a foundation for learning, as promoted by WHO (2021) and echoed in the Philippine Basic Education Development Plan (BEDP) 2030. Lastly, high ratings were also given to community-driven initiatives such as “Collaboration with barangays to set up learning hubs” ($M = 4.00$) and “Conducting reading tutorials and mentoring non-readers” ($M = 4.13$), suggesting the need for extended learning spaces beyond the classroom. These results affirm the role of school- community partnerships, as emphasized in **UNESCO’s Education 2030 Framework**, in supporting inclusive and equitable education. In sum, the findings indicate that intermediate learners require holistic interventions that go beyond academics—addressing literacy, emotional health, family involvement, and community support. These needs must inform extension programs to ensure they are context-responsive and impact-driven.

Table 4

Capacity-building Needs of Teachers Handling Learners with Special Needs

No.	Area of Need	Mean	Verbal Interpretation
1	Understanding common disabilities (ASD, ADHD, SLD, ID, etc.)	4.13	High Need
2	Differentiating instruction for learners with ASD, ADHD, ID, and SLD	4.08	High Need
3	Using multi-sensory approaches for concept mastery	4.08	High Need
4	Creating SPED Resource Corners	3.92	High Need
5	Organizing advocacy campaigns for inclusive education	4.08	High Need
6	Building awareness on disability rights and child protection	4.00	High Need
7	Engaging local leaders and stakeholders in child advocacy	4.08	High Need
8	Promoting inclusive practices in barangay events and settings	3.92	High Need
9	Advocating for child rights and anti-bullying policies in LGU	4.17	Very High Need
10	Modifying seating, lighting, and materials for diverse learners	4.04	High Need
11	Creating calming corners and sensory spaces in schools	4.04	High Need
12	Posting visual schedules, behavior cues, and accessible classroom routines	4.04	High Need
13	Organizing clutter-free, low-distraction areas for learners with sensory needs	4.04	High Need
14	Ensuring barrier-free access and inclusive layout for mobility-impaired learners	4.00	High Need
15	Conducting mental health awareness and psychosocial sessions for parents of learners with disabilities	4.04	High Need
16	Facilitating support groups and counseling circles for caregivers	4.04	High Need
17	Training parents on self-care, stress regulation, and managing burnout	4.00	High Need
18	Partnering with guidance counselors and LGUs to refer parents to support services	3.88	High Need
19	Promoting family-centered approaches in IEP planning and home- school collaboration	3.92	High Need

The overall findings reflect a consistently high level of need across all listed areas, with the highest-rated item being the need to advocate for child rights and anti-bullying policies at the LGU level ($M = 4.17$, Very High Need). This indicates school leaders' strong desire to reinforce inclusive and protective environments beyond the school setting. Core instructional areas such as understanding disabilities, differentiated instruction, and multi-sensory approaches all received high ratings ($M = 4.08$ – 4.13), reflecting the demand for more capacity-building in inclusive pedagogy. According to Tomlinson and Strickland (2005), differentiated instruction is critical in accommodating the diverse needs of learners with exceptionalities, which this study’s respondents clearly affirm.

Environmental adaptations like calming corners, visual cues, and low-distraction areas ($M = 4.04$) are also viewed as essential. These findings are consistent with studies by Boutot and Myles (2016), which highlight the significance of sensory-friendly and visually supportive classrooms for learners with autism and sensory processing challenges. Additionally, mental health and parental support aspects including self-care training for parents, counseling, and family-centered IEP planning all received mean scores of 4.00 and above. This aligns with global and local calls for wraparound support systems for children with disabilities (WHO, 2021; UNESCO, 2020), recognizing that inclusive education extends to the well-being of the child's immediate caregivers. The data underscores the pressing need for NEUST-COED to offer inclusive education training, school-community partnerships, and parent-focused psychosocial programs as part of its extension services. Such interventions would directly address the needs perceived by school leaders and create a more enabling, responsive learning environment for children with special needs.

4. Priority Areas for NEUST-COED Extension Programs

The data gathered from school heads in General Natividad District revealed key areas of need across various domains, particularly in literacy development, inclusive education, and psychosocial support. These findings directly inform the priority areas that may guide the design of NEUST-COED extension programs. The following priority areas are identified based on items with high to very high need ratings (Mean scores ranging from 4.00 to 4.25):

Early Literacy Instruction and Family Engagement

- Teaching foundational reading skills in K to 2 learners, including phonological awareness and decoding.
- Strengthening parent-teacher communication and involving families in early literacy activities such as read-alouds and vocabulary games.
- Partnering with barangays and community sectors for early learning initiatives and literacy promotion (Bautista & Tan, 2018; Epstein, 2001).

Remediation and Contextualized Literacy Across Grade Levels

- Conducting reading tutorials for non-readers and struggling learners.
- Using real-life and functional literacy tasks across subjects (e.g., Science, Math, Araling Panlipunan).
- Developing localized Filipino reading materials and integrating reading comprehension and inferencing (Bernardo et al., 2020; UNESCO, 2016).

Inclusive Education and Disability Awareness

- Understanding and differentiating instruction for learners with ASD, ADHD, SLD, and intellectual disabilities.
- Creating inclusive classroom environments, SPED resource corners, and accessible school facilities.
- Promoting inclusive practices in barangay events and advocating disability rights in LGU activities (Boutot & Myles, 2016; UNESCO, 2020).

Mental Health and Social-Emotional Learning (SEL)

- Conducting mental health awareness sessions and first aid training for teachers.
- Implementing classroom-based SEL strategies and facilitating school guidance activities focused on empathy, self-awareness, and resilience.

- Supporting parents through psychosocial services, counseling circles, and self-care training (World Health Organization, 2021; Tominey & McClelland, 2011).

5. Summary

This study assessed the perceived educational needs of learners at the primary, intermediate, and special needs levels, as identified by school heads in the General Mamerto Natividad District. The results revealed that across all three groups, school leaders consistently expressed high to very high levels of need in multiple domains of early education, literacy development, inclusive education, and psychosocial support. For primary-level learners, high needs were identified in the areas of early literacy instruction, family engagement, and community collaboration, with the highest priority placed on empowering parents for holistic child development. Moderately rated needs, particularly in fine and gross motor skills, suggest areas requiring increased awareness and integration into instructional design. At the intermediate level, very high needs emerged in facilitating socio-emotional learning and guidance activities, as well as addressing reading remediation. School heads also acknowledged the importance of mental health programs, community-based interventions, and family participation in sustaining academic progress and learner well-being. For learners with special needs, the findings showed uniformly high needs in instructional differentiation, environmental accommodations, advocacy, and parental support systems. A very high need was particularly noted in advocating for child rights and anti-bullying policies at the LGU level, indicating an extended view of inclusion beyond classroom strategies.

Recommendations - Based on the results, the following recommendations are offered for consideration by NEUST-College of Education (COED), education stakeholders, and local education units:

Design and implement targeted extension programs

- Develop and deploy training modules on early literacy, reading intervention, and differentiated instruction tailored to primary and intermediate levels.
- Provide capability-building for inclusive education, focusing on classroom accommodations, multi-sensory strategies, and special needs awareness.

Promote family engagement and parenting support:

- Conduct parenting workshops on holistic child development, mental health, resilience, and behavior management, especially for families with children with disabilities.
- Support family-centered planning in IEP formulation and strengthen communication channels between schools and homes.

Strengthen community-based learning environments:

- Partner with barangays to establish learning hubs, remedial reading centers, and inclusive play areas.
- Expand collaboration with LGUs for policy advocacy related to child protection, anti-bullying, and access to services for learners with special needs.

Institutionalize mental health and SEL initiatives:

- Train teachers in SEL integration, mental health first aid, and classroom guidance activities.
- Coordinate with guidance counselors and local agencies to offer psychosocial support for learners, parents, and school personnel.

Sustain research and policy feedback loops:

- Use the study's results to inform the design of NEUST COED's extension services and teacher preparation programs.
- Encourage follow-up research to explore implementation gaps and assess the effectiveness of interventions in the identified high-need areas.

6. Conclusion

The findings indicate that educational leaders perceive significant and diverse needs among learners at different developmental stages. Core academic competencies such as early reading, comprehension, and contextualized instruction remain foundational. However, equally prioritized are non-academic dimensions, including mental health, family engagement, inclusive practices, and partnerships with barangays and local government units. These results highlight that holistic education cannot be achieved through classroom instruction alone. Instead, a whole-child, whole-school, and whole-community approach is essential particularly in resource-constrained or marginalized settings. Strengthening the capacity of educators, parents, and communities is crucial for delivering equitable, inclusive, and learner-centered education.

Author AI Use Disclosure - The authors declare that generative AI tools (CoPilot and Gemini Ai) were used in a limited and supervisory capacity during the preparation of this manuscript titled "*Breaking Barriers to Inclusion: A Study on the Need for an Inclusive Learning Resource Center in Palayan City.*" These tools were employed specifically to improve readability, refine the language, and structure the project narrative. After using these tools, the authors reviewed, edited, and verified the content as needed. The authors maintain full responsibility for the accuracy, integrity, and original contributions of this work.

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An inventory of flora species at Central Bicol State University of Agriculture Pasacao Campus

Diesta, Glydel Grace A. ✉

Central Bicol State University of Agriculture, Philippines (glydelgrace.diesta@cbsua.edu.ph)

Cardinal, Allysa Camille B.

Millena, Justine Jane E.

Rufino, Claire Princes D.

Arquilla, Catherine N.

San Agustin, Josalyn O.

Aban, Judith J.

Nolasco, Michael N.



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Abstract

This study conducted a floristic inventory within the Central Bicol State University of Agriculture Pasacao Campus to identify plant species, assess their abundance, and determine their conservation status. The study aimed to provide baseline data for biodiversity conservation, ecological education, and sustainable campus management using a descriptive quantitative design through systematic sampling across five study sites. A total of 261 individual plants representing 54 species under 32 families were recorded. The dominant families identified were Asteraceae, Fabaceae, Poaceae, and Commelinaceae, which are known for their adaptability to tropical and disturbed environments. Among the sampling sites, Site 5 (Production Area) had the highest species richness with 69 species, while Site 3 (Shrub Area) recorded the lowest with 40 species. Herbs comprised the largest proportion of flora at 48%, followed by shrubs (21%), trees (18%), grasses (9%), and ornamentals (4%). This indicates that the campus vegetation is in an early to mid-successional stage dominated by pioneer species. Conservation status assessment based on DENR DAO 2017 11 and IUCN (2024) showed that 72% of species were classified as Least Concern, 15% as Introduced, 8% as Vulnerable, 3% as Endangered, and 2% as Near Threatened. Notable species included *Vitex parviflora* (Molave) and *Swietenia macrophylla* (Mahogany). The findings show that CBSUA Pasacao Campus supports moderately diverse flora and serves as a valuable foundation for biodiversity monitoring, conservation planning, and environmental education. Further studies are recommended to strengthen conservation strategies for native and threatened species.

Keywords: biodiversity, campus ecology, conservation, floristic inventory, sustainable management

An inventory of flora species at Central Bicol State University of Agriculture Pasacao Campus

1. Introduction

Biodiversity is essential for ecosystem stability, resilience, and productivity because it supports ecological processes such as climate regulation, nutrient cycling, pollination, and water purification. Flora, as a major component of biodiversity, plays a key role in maintaining habitats and sustaining ecosystem health (CBD, 2020). However, biodiversity worldwide is rapidly declining due to habitat destruction, climate change, pollution, and invasive species. According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2019), around one million species are threatened with extinction. In response, global initiatives such as the Kunming-Montreal Global Biodiversity Framework aim to strengthen conservation efforts worldwide (UN, 2023).

The Philippines is recognized as one of the world's megadiverse countries, with thousands of endemic plant species (DENR-BMB, 2020). Despite this richness, biodiversity in the country faces threats from deforestation, urbanization, agricultural expansion, and environmental degradation. Between 2001 and 2020, the Philippines lost about 1.34 million hectares of tree cover (Global Forest Watch, 2021). To address these challenges, the government implemented the Philippine Biodiversity Strategy and Action Plan (PBSAP 2015–2028), which promotes biodiversity conservation and sustainable development (DENR, 2015). Localized biodiversity studies, such as flora inventories, are important in supporting conservation initiatives. Academic institutions and campuses can serve as valuable sites for documenting plant diversity because they often contain a mixture of native, ornamental, and introduced species (Aronson et al., 2017). Flora inventories provide baseline data that support environmental management, conservation planning, and ecological education.

The Central Bicol State University of Agriculture Pasacao Campus in Camarines Sur is situated in a coastal and rural environment with diverse microhabitats such as gardens, agricultural areas, roadsides, and woodlots. Despite its ecological importance, no formal inventory of plant species has yet been conducted on the campus. The absence of documented flora limits opportunities for biodiversity monitoring, conservation planning, and environmental education. Conducting a flora inventory at CBSUA Pasacao Campus is therefore necessary to establish a baseline record of plant species present in the area. The study can support campus sustainability programs, ecological landscaping, and conservation education while also serving as a learning resource for students and researchers. In addition, the inventory aligns with the university's commitment to environmental stewardship and supports the United Nations Sustainable Development Goal 15: Life on Land, which focuses on protecting and restoring terrestrial ecosystems (UN, 2015).

This study aims to identify and document the plant species found within CBSUA Pasacao Campus. Specifically, it seeks to create a baseline flora record, identify species with ecological or cultural significance, and provide data that can guide future biodiversity conservation and sustainable land-use planning within the institution.

Statement of the Problem - Despite being located in a biologically rich province, the Central Bicol State University of Agriculture (CBSUA) Pasacao Campus has not undergone a systematic documentation of its plant biodiversity. The absence of a baseline flora inventory limits the campus's capacity to assess ecological changes, manage green spaces effectively, and integrate biodiversity conservation into academic and extension programs. This study seeks to address the following central problem: What is the current status of flora species diversity within CBSUA Pasacao Campus? To answer this, the study aims to address the following specific questions: 1.) What are the identified plant species present within the campus, and how are they classified taxonomically (e.g., native, endemic, introduced, ornamental, cultivated)? 2.) What is the relative abundance and frequency of occurrence of each plant species across different microhabitats within the campus? 3.) Which species, if any, show

ecological importance, potential conservation concern, or local significance? 4.) How can the data from this inventory support biodiversity conservation, education, and sustainable land-use planning within the campus?

Objective of the Study - The main objective of this study is to conduct a comprehensive inventory of flora species within the CBSUA Pasacao Campus to provide baseline data for biodiversity assessment, conservation planning, and environmental education. Specifically, the study aims to: 1.) Identify and document the plant species present within the CBSUA–Pasacao Campus and classify them according to their taxonomy and ecological status (e.g., native, endemic, introduced, ornamental, or cultivated). 2.) Determine the relative abundance and frequency of occurrence of plant species across different habitat types within the campus. 3.) Assess the ecological significance and potential conservation value of identified flora. 4.) Provide recommendations for campus-based biodiversity conservation, environmental education, and sustainable land-use practices based on the findings.

Significance of the Study - This research provides multiple layers of significance—ecological, educational, institutional, and societal—emphasizing the importance of local biodiversity assessment within academic environments.

- **CBSUA Administration** – The findings will equip university planners and administrators with crucial baseline data for developing and implementing biodiversity-friendly policies and sustainable land-use practices. It can inform future decisions related to campus landscaping, reforestation, and environmental infrastructure, ultimately aligning with the institution’s sustainability goals.
- **Students and Educators** – The documented flora species will serve as a valuable learning material for various academic disciplines such as biology, agriculture, environmental science, and forestry. It encourages field-based learning, scientific inquiry, and student-led research while promoting botanical literacy and environmental awareness across the academic community.
- **Environmental Agencies and Researchers** – The inventory can serve as a reference for regional conservation programs and ecological assessments. It supports national and local efforts under the Philippine Biodiversity Strategy and Action Plan (PBSAP 2015–2028) and provides data that may be used in mapping threatened or endemic species, habitat quality assessments, and restoration planning.
- **Local Community** – By highlighting the rich plant diversity within the campus, the study fosters a deeper understanding and appreciation of local natural resources. It can serve as a model for community-based biodiversity efforts and raise public awareness on the importance of conserving native and endemic plant species. Engagement with local knowledge may also strengthen traditional ecological practices and values.
- **Policy Makers and Extension Workers** – The results of the study may inform policies and outreach programs aimed at environmental conservation, climate adaptation, and sustainable agriculture. It can contribute to the development of community-based biodiversity education and eco-tourism initiatives, potentially offering socio-economic benefits to surrounding communities.
- **Global Biodiversity Goals** – On a broader scale, the study contributes to global environmental commitments such as the United Nations Sustainable Development Goal 15: Life on Land, and the Kunming-Montreal Global Biodiversity Framework, which both underscore the urgency of conserving terrestrial ecosystems and halting biodiversity loss.

Scope and Delimitation - This study focuses on the identification and documentation of terrestrial plant species within the accessible areas of the Central Bicol State University of Agriculture (CBSUA)–Pasacao Campus. It includes visible plants such as trees, shrubs, herbs, and grasses found within the campus grounds. The study is limited to terrestrial flora and excludes fauna, aquatic vegetation, mosses, lichens, fungi, soil analysis, and ecological interactions. It provides a snapshot of plant diversity during the survey period, which may be influenced by seasonal conditions and inaccessible areas. To establish a baseline record of campus flora for future monitoring.

Theoretical Framework - Ecological succession is the natural and gradual process by which ecosystems change and develop over time. It describes how biological communities evolve from simple to more complex forms, beginning with pioneer species and progressing toward a more stable, mature ecosystem known as a climax community.

Ecological succession Theory - Succession is an ecological process that explains how plant communities change over time. It was first introduced by Frederic Clements (1916), who described it as a predictable progression toward a stable climax community. Eugene Odum (1969) later expanded this idea by emphasizing ecosystem functions such as energy flow, nutrient cycling, and stability throughout the stages of succession. Succession is generally classified into primary succession, which occurs in lifeless areas without soil, and secondary succession, which happens in disturbed areas where soil remains. At the Central Bicol State University of Agriculture, vegetation is mainly shaped by secondary succession due to past land use such as farming, construction, and landscaping. Over time, these disturbed areas are naturally recolonized by a mix of native and introduced plant species, gradually forming more complex and stable plant communities. Understanding this process helps explain the current vegetation patterns on campus and supports better planning for biodiversity conservation and ecological restoration.

Habitat fragmentation and landscape ecology further explain how human activities affect ecosystems. Habitat fragmentation occurs when large, continuous habitats are broken into smaller, isolated patches due to urban development, agriculture, roads, and other land-use changes (Fahrig, 2003). This reduces habitat size, limits species movement, decreases genetic diversity, and increases the risk of local extinction. Landscape ecology complements this by studying how the arrangement and connectivity of habitats influence ecological processes (Turner, 1989). It emphasizes that not only habitat size but also spatial structure matters for biodiversity. Connected landscapes support movement, reproduction, and survival of species, while highly fragmented ones weaken ecosystem stability. Together, succession theory, habitat fragmentation, and landscape ecology provide a useful framework for understanding how plant communities develop and respond to disturbance, especially in human-influenced environments like CBSUA Pasacao Campus.

Habitat Fragmentation - Within the Central Bicol State University of Agriculture, the landscape is a mix of grasslands, gardens, groves, and built areas, creating fragmented habitats. These areas support different plant micro-ecosystems but may also face issues such as invasive species and limited ecological connectivity. Understanding this helps explain how plant species are distributed on campus and supports better biodiversity planning and restoration. The Species–Area Relationship (SAR), introduced by Arrhenius (1921), explains that larger areas usually have more species because they contain more habitats and resources. It is expressed as $S = cA^z$, where S is species number, A is area, c is a constant, and z shows how quickly species increase with area.

Species-Area Relationship - Within the Central Bicol State University of Agriculture, the variety of habitats such as open fields, groves, gardens, and built areas supports diverse plant communities. These microhabitats create different ecological niches that allow a wide range of plant species to thrive, from grasses and herbs to shrubs and trees. The Species–Area Relationship (SAR), introduced by Arrhenius (1921), explains that larger and more diverse areas tend to support higher species richness due to increased habitat availability and resources. This study is grounded on three ecological theories: ecological succession, habitat fragmentation and landscape ecology, and the species–area relationship. Succession explains how plant communities develop over time, with secondary succession being dominant on campus due to past land use such as farming and construction. Habitat fragmentation and landscape ecology describe how mixed land-use patterns shape plant distribution by influencing connectivity and habitat diversity. SAR explains how differences in habitat size affect species richness across the campus. Together, these theories provide a framework for understanding plant diversity in CBSUA Pasacao Campus. Succession explains temporal changes, fragmentation explains spatial patterns, and SAR explains species richness differences. This integrated approach supports the study's goals of identifying flora, understanding their distribution, and guiding biodiversity conservation and land-use planning on campus.

Conceptual Framework - The conceptual framework of this study is based on biodiversity assessment and ecological inventory within the Central Bicol State University of Agriculture. It follows an input–process–output (IPO) model. In the input phase, tools such as field notebooks, GPS, quadrat sampling materials, cameras, and identification guides are used to document plant species across different campus habitats like fields, groves, gardens, and cultivated areas. In the process phase, field surveys are conducted using quadrat and transect methods. Plant species are identified using taxonomic keys and verified through references or expert consultation. Data are then organized based on plant type (trees, shrubs, herbs, grasses), ecological status (native, endemic, introduced, invasive), and habitat. Descriptive statistics are used to assess species richness and distribution. In the output phase, the study produces a complete flora inventory listing all identified plant species, their classifications, and distribution patterns. Visual outputs such as simple maps and charts may also be included. This inventory provides baseline ecological data for the campus, supports biodiversity conservation and environmental education, and helps guide sustainable land-use planning and future ecological studies.

Definition of Terms - This section provides conceptual and operational definitions of key terms used throughout the study to ensure clarity and a common understanding of concepts related to flora inventory and biodiversity assessment.

- **Abundance** is conceptually defined as the number of individuals of a species present within a given area, serving as an indicator of species dominance. In this study, abundance refers to the count and relative presence of individual plant species documented within sampling plots across the campus.
- **Biodiversity** is conceptually defined as the variety and variability of life forms, including plants, animals, fungi, and microorganisms within ecosystems at global, regional, or local levels. In this study, biodiversity specifically refers to the diversity of terrestrial flora species identified and documented within the CBSUA Pasacao Campus.
- **Biodiversity Conservation** is the practice of protecting, managing, and restoring species, habitats, and ecosystems to ensure their long-term sustainability. In this study, biodiversity conservation refers to how the inventory findings can support campus-based initiatives such as ecological awareness, education, and sustainable land-use planning.
- **Conservation Concern** refers to the need to prioritize species or habitats for protection due to threats such as rarity, endemism, habitat loss, or invasive competition. In this study, conservation concern applies to flora species within CBSUA Pasacao Campus that are rare, threatened, or ecologically significant.
- **Ecological Importance** is conceptually defined as the role a species plays in maintaining the structure, function, and stability of an ecosystem. In this study, ecological importance refers to plant species within the campus that provide significant ecological functions such as habitat provision, soil stabilization, or contribution to successional processes.
- **Ecological Succession** is the natural and gradual process through which ecosystems change and develop over time, beginning with pioneer species and progressing toward stable climax communities. For this study, ecological succession is observed in the plant communities across the campus, where secondary succession is most evident due to historical land-use practices such as farming, construction, and landscaping.
- **Endemic species** are conceptually defined as plants or animals that are native to and found only within a specific geographic location. In the context of this study, endemic refers to plant species that are exclusive to the Philippines and are recorded within the CBSUA Pasacao Campus.
- **Flora** generally refers to the plant life of a particular region or time, often describing naturally occurring or indigenous plants. For this study, flora encompasses all terrestrial plants—including trees, shrubs, herbs, and grasses—that are identified within the campus grounds.

- **Frequency of Occurrence** refers to the consistency with which a species appears in sample plots or habitats. In this study, frequency is measured by recording how often a species occurs across quadrats or transects in CBSUA Pasacao Campus.
- **Habitat** is conceptually defined as the natural environment in which a species or group of species lives, providing essential conditions for growth and survival. Operationally, this study considers habitats as the different environments within CBSUA Pasacao Campus, such as grasslands, gardens, groves, and open fields, where plant species are found.
- **Herbaceous Plants (Herbs)** are non-woody plants that have soft stems and typically die back at the end of the growing season. In this study, herbs are included as one of the life forms categorized in the flora inventory conducted within the campus.
- **Introduced Species** are those brought into an area where they do not naturally occur, often due to human activity, whether intentionally or accidentally. In this study, introduced species are plant species within the campus that are not naturally occurring in the Philippines but have been cultivated or unintentionally established.
- **Invasive Species** are defined as non-native species that spread rapidly and cause ecological, economic, or social harm. In this study, invasive species refer to non-native plants recorded in the campus that may potentially threaten native and endemic flora.
- **Inventory** is conceptually defined as a systematic listing or record of items, compiled through observation and documentation. For the purposes of this study, inventory refers to the systematic documentation of terrestrial flora species present within the CBSUA Pasacao Campus.
- **Life Form** is conceptually defined as the structural and functional growth form of a plant, such as tree, shrub, herb, or grass. In this study, life form is used as a basis for classifying and categorizing the flora species documented within the CBSUA Pasacao Campus.
- **Local Significance** is conceptually defined as the cultural, educational, or economic value of species within a community. In this study, local significance refers to flora species in the campus that have practical uses (e.g., food, medicine, ornamentals) or serve as learning resources for students and researchers.
- **Native Species** are species that naturally occur in a particular region or ecosystem without human introduction. Operationally, in this study, native species are Philippine plants that naturally grow within the CBSUA Pasacao Campus.
- **Plant Species Diversity** is conceptually defined as the variety and variability of plant species within a given area, reflecting both the number of species and their relative abundance. In this study, plant species diversity refers to the documented terrestrial flora within CBSUA Pasacao Campus, measured through species richness, abundance, and distribution across different microhabitats.
- **Quadrat Sampling** is an ecological method used to isolate a standard unit of area for the study of species distribution within a habitat. In this study, quadrat sampling is applied to selected areas of the campus to estimate and record the presence of plant species within a defined plot.
- **Species Richness** is defined as the number of different species present in a community, landscape, or region, and is commonly used as a measure of biodiversity. In this study, species richness refers to the count of distinct flora species documented within CBSUA Pasacao Campus.
- **Taxonomic Classification** refers to the systematic arrangement of species into hierarchical categories such as family, genus, and species, as well as identifying their ecological origin as native, endemic, introduced, ornamental, or cultivated. In this study, taxonomic classification is applied to organize and describe the flora

species recorded within the campus.

- **Transect Walk** is a sampling method where researchers follow a fixed path or line to record the presence or absence of species. In this study, transect walks are conducted along predetermined routes within the campus to document and assess the distribution of flora species.
- **Woody Plants** are conceptually defined as plants that produce wood as their structural tissue, including trees, shrubs, and lianas. In this study, woody plants are recorded and categorized as part of the flora inventory conducted within the CBSUA Pasacao Campus.

2. Methodology

This section outlines the overall research design and methods employed to achieve the study's objectives. It includes the Research Design, Research Method, Population and Sampling Design, Data Gathering Procedure, and Statistical Treatment of Data used in the documentation and assessment of flora species within CBSUA Pasacao Campus.

Research Design - This study uses a descriptive research design (Sutherland et al., 2022; UNEP, 2021), which is appropriate for observing and recording existing conditions without manipulating variables. It is used to systematically document plant species within the Central Bicol State University of Agriculture, creating a baseline inventory of its floral diversity. The design focuses on field observation and data collection to describe the composition, abundance, and distribution of plants across different campus microhabitats. It is a non-experimental approach that emphasizes “what exists” in natural settings, making it suitable for biodiversity inventories (CBD, 2022). The results provide important baseline data for ecological monitoring, conservation planning, and environmental education.

Research Method - This study uses a field-based observational method to gather accurate baseline data on campus flora (Cunningham et al., 2021). Field observation is commonly applied in biodiversity studies to directly identify, classify, and record plant species within a specific area. In this study, researchers conduct on-site assessments within the Central Bicol State University of Agriculture to document flora species in their natural environment. The method allows both qualitative and quantitative data collection without disturbing the ecosystem. Tools such as field notebooks, GPS devices, identification guides, and cameras are used to ensure accuracy. This approach is effective for producing reliable biodiversity inventory data and aligns with standard ecological documentation practices (Sutherland et al., 2022).

Population and Sampling Design - The study covers the entire 4.5-hectare Central Bicol State University of Agriculture plant community, including trees, shrubs, herbs, grasses, and ornamental plants. It uses purposive sampling, a non-probability method commonly applied in ecological studies (Kent, 2022), to select representative areas of the campus. Five sampling sites were identified across different land-use zones: the Band and Majorette Rooms (Site 1), Eco Park from ES Building to Admission Office (Site 2), Registrar to Academics Office and English Rooms (Site 3), Academic Building 6 to Laboratory Rooms (Site 4), and the Production Area and surrounding spaces (Site 5). Within these sites, quadrat and transect methods were used depending on vegetation type. Small 1m × 1m quadrats were used for herbs and grasses, while 10m × 10m plots were used for shrubs and trees. This systematic approach ensures representative sampling of plant diversity across different habitats (Sutherland et al., 2022; Kent, 2022).

Data Gathering Procedure - Data gathering is conducted through direct field surveys across the five sampling sites of the Central Bicol State University of Agriculture. A preliminary survey is done to define site boundaries and locate suitable quadrat and transect areas. Sites 1, 3, and 4 focus on ornamental and landscaped vegetation using quadrats placed in gardens and built-up green spaces. Site 2 (Eco Park) uses larger quadrats and transects to sample trees, shrubs, and understory plants. Site 5 covers production areas, grasslands, and semi-natural vegetation. Within each quadrat, plant species are identified and recorded, including scientific name, growth form, abundance,

frequency, dominance, and GPS location. Identification is supported by field guides and databases (Royal Botanic Gardens, Kew, 2023). Unidentified specimens are documented, photographed, and later verified through herbarium comparison or expert consultation. Data collection is done under favorable weather conditions and recorded in field notes and digital spreadsheets for analysis (UNEP, 2021).

Statistical Treatment of Data - Data analysis uses descriptive statistics and biodiversity indices to assess plant diversity within the Central Bicol State University of Agriculture (Jost, 2021). Species frequency is based on the number of sampling units where a species occurs, while relative frequency compares this to total frequency. Dominance is measured through coverage or basal area within plots. Species richness refers to the total number of species recorded, while abundance is the number of individuals per species. Biodiversity is further evaluated using Shannon-Wiener Index, Simpson's Index, and Species Evenness Index, which are standard tools in ecological studies (Sutherland et al., 2022; Jost, 2021). Results are presented using bar charts and pie charts to show frequency, abundance, dominance, and diversity patterns. All computations are processed using Microsoft Excel and related ecological analysis tools.

3. Result and Discussion

This section presents and interprets the results of the floristic inventory conducted within the CBSUA–Pasacao Campus, highlighting the identified plant species, their relative abundance, conservation status, and the implications of these findings for biodiversity conservation and sustainable campus management.

3.1 Taxonomic Classification and Identified Plant Species

A total of 261 individual plants, representing 54 species from 32 families, were recorded in the Central Bicol State University of Agriculture. The dominant families were Asteraceae, Fabaceae, Poaceae, and Commelinaceae, which are commonly found in tropical and disturbed environments due to their adaptability and efficient reproduction (Palma & Dagonio, 2024; Christenhusz & Byng, 2018). Asteraceae species thrive in open areas because of high seed production, while Fabaceae can grow in nutrient-poor soils through nitrogen fixation. Poaceae species are also common in open and disturbed habitats due to their rapid growth and tolerance to environmental stress (Mandel et al., 2019; Soumare et al., 2020).

Table 1
Number of Plant Species per Site and Dominant

Site	Dominant Classification	Most Abundant Families	No. of Individual	Notable Species
Site 1	Herbs, Ornamental	Asteraceae, Commelinaceae	46	Tropical spiderwort, Brazilian joy weed
Site 2	Herbs, Trees	Asteraceae, Rutaceae	42	Cinderella weed, Pomelo
Site 3	Shrubs, Herbs	Meliaceae, Musaceae	40	Big-leaf mahogany, Saba banana
Site 4	Herbs, Grasses	Poaceae, Asteraceae	64	Crabgrass, Little ironweed
Site 5	Herbs, Trees	Cyperaceae, Musaceae	69	Mindoro, flatsedge, Saba Banana

Among the five sampling sites, Site 5 (Production Area) had the highest species richness (69), while Site 3 (Shrub Area) had the lowest (40) in the Central Bicol State University of Agriculture. This variation reflects differences in light availability, soil moisture, and disturbance levels. Open and frequently disturbed areas often support more species due to favorable conditions for herbaceous and opportunistic plants (Isbell et al., 2017). The high diversity in the production area may also result from human activities such as cultivation, soil disturbance, and plant introduction, which increase species establishment (Lehmann et al., 2019). In contrast, shrub-dominated areas have lower diversity due to limited light, higher competition, and denser vegetation cover (Kurata, 2021). Overall, the dominance of herbaceous and disturbance-tolerant species suggests a vegetation pattern typical of semi-managed landscapes. The production and open areas function as biodiversity hotspots within the campus,

showing that managed environments can still support high species richness (FAO, 2020; Cruz, 2025).

3.2 Relative Abundance and Frequency of Occurrence

Relative abundance shows that herbs were the most dominant growth form, accounting for 48% of recorded species in the Central Bicol State University of Agriculture, followed by shrubs (21%), trees (18%), grasses (9%), and ornamentals (4%). The dominance of herbs indicates a vegetation structure typical of moderately disturbed, high-light environments where fast-growing and opportunistic species thrive. Similar findings were reported by Santos et al. (2024), who noted that herbaceous plants dominate open tropical ecosystems affected by human activity such as cultivation or grazing. Garcia and Villanueva (2023) also found that herbs are highly adaptive in tropical lowland areas due to their rapid life cycles and efficient reproduction, allowing them to quickly recolonize disturbed habitats

Table 2
Relative Abundance of Plant Classifications

Classification	No. of Individual	Percentage (%)	Common Example
Herbs	26	48%	Spreading dayflower, Cinderella weed
Shrubs	11	21%	Big-leaf mahogany, river tamarind
Trees	10	18%	Mango, Molave
Grasses	5	9%	Crabgrass, Tufted lovergrass
Ornamental	2	4%	Brazillan joyweed, Pinto peanut

The dominance of herbaceous species such as *Eleutheranthera ruderalis* and *Commelina diffusa* in the Central Bicol State University of Agriculture indicates their ability to thrive in disturbed environments due to traits like rapid growth, high seed production, and vegetative propagation (Chen et al., 2023). Their widespread occurrence suggests they function as pioneer species that stabilize soil and support early succession. Herbaceous dominance also reflects an early to mid-successional stage, where open conditions favor low-stature plants before woody species establish (Lopez & Kim, 2025). The relatively lower proportion of shrubs (21%) and trees (18%) suggests ongoing disturbance or regeneration, as repeated human activities can limit woody plant growth (Martinez et al., 2024). The low presence of grasses (9%) and ornamentals (4%) indicates a mixed-use, semi-managed ecosystem where natural and cultivated vegetation coexist (Hernandez & Rivera, 2025). Similar patterns were observed in other tropical and urban green spaces where herbs dominate due to mowing and disturbance (Mogildea et al., 2024; Palma & Dagonio, 2024). Overall, herbaceous dominance highlights both ecological benefits such as soil stabilization and pollinator support, and limitations such as reduced habitat for arboreal species (Reyes & Ventura, 2018). This suggests the need for balanced vegetation management to enhance biodiversity and structural complexity.

3.3 Ecological Importance, Conservation Status, and Local Significance

Of the 54 plant species identified, 72% were classified as Least Concern (LC), 15% as Introduced, 8% as Vulnerable (VU), 3% as Endangered (EN), and 2% as Near Threatened (NT) (DENR–DAO 2017-11; IUCN, 2024). *Vitex parviflora* (Molave) and *Swietenia macrophylla* (Mahogany) are the most significant tree species due to their ecological and cultural value. Their declining population highlights the importance of in-situ and ex-situ conservation efforts within the campus and surrounding communities (FAO, 2020).

Table 3
Summary of Species Conservation Status

Conservation Status	No. of Individual	Percentage
Least concern (LC)	39	72%
Introduced	8	15%
Vulnerable (VU)	4	8%
Endangered	2	3%
Near Threatened (NT)	1	2%

Despite this apparent stability, the presence of species categorized as Vulnerable and Endangered within the study area carries significant ecological and conservation implications. Notably, *Vitex parviflora* (Molave) and *Swietenia macrophylla* (Mahogany) were recorded among the species of concern. *Vitex parviflora*, a native Philippine hardwood, is valued for its dense and durable timber and plays an important role in the country's cultural and ecological heritage. However, its populations have declined due to extensive logging and deforestation (Threatened Taxa, 2022). Although the species is currently listed as Least Concern globally by the IUCN, it remains threatened at the national level, as recognized by the Department of Environment and Natural Resources (DENR–DAO 2017-11) and local conservation groups (BINHI, 2024).

Swietenia macrophylla (Mahogany), in contrast, is an introduced species that was widely planted in reforestation and ornamental programs across the Philippines. While it provides ecological services such as shade and carbon storage, its widespread use has raised ecological concerns regarding competition with native tree species and the potential alteration of native forest composition (FAO, 2020). The presence of both *V. parviflora* and *S. macrophylla* on campus highlights the dual role of the site in preserving native biodiversity while also hosting introduced species that require careful management to avoid dominance or ecological imbalance. The vegetation composition based on conservation status therefore reflects a dynamic plant community where ecologically stable LC species coexist with a smaller proportion of nationally threatened and introduced taxa. This mixture indicates both the resilience of the local ecosystem and the influence of human activity through landscape modification and planting practices. Continued biodiversity monitoring, protection of native tree populations, and the responsible management of introduced species are recommended to sustain ecological balance. In this context, the study area functions not only as an academic and recreational space but also as a living repository of Philippine plant diversity, emphasizing the importance of campus environments in supporting local conservation initiatives.

The recorded 15% of introduced species reflects a moderate degree of biotic homogenization, a condition commonly observed in landscaped or semi-managed ecosystems where non-native plants are cultivated for ornamental or educational purposes. Such homogenization can reduce native biodiversity by promoting the dominance of widespread generalist species and altering ecosystem dynamics (González-Moreno et al., 2017). While introduced ornamentals enhance the visual appeal and educational value of the campus, they may also compete with native flora for resources and modify soil and light conditions, potentially leading to ecological imbalance if left unmanaged (van Kleunen et al., 2018). Therefore, regular monitoring of introduced flora and the implementation of native plant restoration programs are recommended to prevent potential invasive expansion and sustain ecological equilibrium within the study area. The presence of threatened native species on campus offers a unique opportunity for in-situ conservation, environmental education, and research-based propagation. Establishing native plant nurseries or mini-conservation plots could serve both ecological and pedagogical functions, aligning with the biodiversity goals of the Central Bicol State University of Agriculture (CBSUA) and national conservation strategies. These initiatives support the objectives outlined in the Philippine Biodiversity Strategy and Action Plan (PBSAP) 2015–2028 (DENR–BMB, 2019) and contribute to the global call for nature-positive campuses that foster biodiversity resilience and public awareness (Aronson et al., 2017).

3.4 Implication for Biodiversity Conservation, Education and Sustainable Land Use

The flora inventory provides a scientific baseline for campus biodiversity management and sustainability initiatives. Its integration into research, education, and planning offers several practical applications.

Table 4
Proposed Applications of Flora Inventory Data

Application Area	Proposed Used	Expected Outcome
Biodiversity Conservation	Baseline for native species protection	Enhance ecosystem resilience
Education and Research	Use in field taxonomy and botany classes	Increased student awareness
Campus Greening	Planting native and adaptive species	Improved microclimate and aesthetics
Sustainable Land Used	Integrating flora data in planning	Balanced development and ecology

The flora inventory provides a scientific baseline for biodiversity management and conservation planning within the Central Bicol State University of Agriculture. It helps assess ecological health, identify priority species, and monitor vegetation changes over time. The recorded diversity highlights the campus as a semi-managed ecosystem supporting both native and introduced species, serving as a basis for biodiversity planning and policy development (Mendoza, 2021). The data also have academic value, as integrating the inventory into botany and ecology courses enhances experiential learning. Students gain hands-on experience in species identification and ecological assessment, improving environmental literacy and engagement in sustainability efforts (Paguirigan, 2020).

The campus can function as a living laboratory for education, research, and conservation. Establishing biodiversity conservation zones and ex-situ nurseries for native species such as *Vitex parviflora* and *Swietenia macrophylla* supports conservation goals and awareness programs. Campus biodiversity initiatives also strengthen ecological learning and participation (Turner-Skoff & Cavender, 2019). In addition, using native and climate-adaptive plants in greening programs can improve microclimate conditions and ecological stability (Fajardo et al., 2023). Integrating floristic data into land-use planning helps protect high-diversity areas while balancing development and conservation goals (DENR-BMB, 2019). Overall, the findings show that CBSUA-Pasacao supports diverse but disturbance-adapted flora that can sustain long-term environmental and sustainability initiatives.

4. Summary of Findings, Conclusions, and Recommendations

4.1 Plant Species Composition and Taxonomic Classification

Findings - The floristic inventory conducted within the Central Bicol State University of Agriculture recorded 261 individual plants representing 54 species distributed across 32 families. The identified flora consisted of native, introduced, ornamental, and cultivated species, reflecting both natural ecological processes and anthropogenic landscape management within the campus. Among the recorded families, Asteraceae, Fabaceae, Poaceae, and Commelinaceae were the most dominant. These plant families are commonly associated with tropical and disturbed habitats because of their adaptability and ecological resilience. Their dominance suggests that several species are highly suited to semi-managed environments found throughout the campus. The occurrence of ornamental and cultivated plants further reflects landscaping and beautification practices implemented within the university grounds, while naturally occurring species persisted in relatively less disturbed areas. Overall, the interaction between managed and unmanaged vegetation contributed to a heterogeneous vegetation structure across the campus.

Conclusion - The findings indicate that CBSUA-Pasacao Campus supports a moderately diverse plant community composed of various taxonomic classifications, including native, introduced, ornamental, and cultivated species. The observed diversity reflects the interaction between natural ecological conditions and human activities within the campus environment.

Recommendations - The university should establish a comprehensive plant inventory database and herbarium collection to document identified species for research, instruction, and conservation purposes. In addition, future landscaping and planting initiatives should prioritize native and ecologically significant species to strengthen biodiversity conservation and ecological sustainability within the campus.

4.2 Relative Abundance and Frequency of Occurrence Across Microhabitats

Findings - The abundance and distribution of plant species varied among the five sampling sites within the Central Bicol State University of Agriculture due to differences in microhabitat characteristics, vegetation structure, and land-use practices. Site 5 (Production Area) exhibited the highest species richness with 69 recorded individuals, whereas Site 3 (Shrub Area) showed the lowest richness with 40 individuals. These differences indicate the

influence of environmental factors such as sunlight exposure, soil conditions, vegetation density, and human disturbance on species distribution. Herbaceous plants dominated the campus flora, accounting for 48% of the recorded vegetation, followed by shrubs (21%), trees (18%), grasses (9%), and ornamentals (4%). This composition suggests that several areas of the campus are open and moderately disturbed. Species such as *Eleutheranthera ruderalis* and *Commelina diffusa* were widely distributed across sampling sites, demonstrating strong ecological adaptability to varying environmental conditions.

Conclusion - Variations in species abundance and occurrence among microhabitats highlight the influence of environmental conditions and campus land-management practices on plant distribution. Open and moderately disturbed habitats favored the dominance of herbaceous species, whereas more stable vegetation structures supported the occurrence of shrubs and trees.

Recommendations - The university should implement vegetation zoning and habitat management strategies to promote a more balanced vegetation structure across the campus. Increasing the planting of native tree and shrub species may improve structural diversity, enhance ecological stability, and provide suitable habitats for wildlife.

4.3 *Ecological Importance, Conservation Concern, and Local Significance of Plant Species*

Findings - The conservation status of the recorded plant species was evaluated using Department of Environment and Natural Resources Administrative Order 2017-11 and the International Union for Conservation of Nature (2024). Results showed that 72% of the identified species were classified as Least Concern (LC), indicating relatively stable populations. However, 8% were categorized as Vulnerable (VU), 3% as Endangered (EN), 2% as Near Threatened (NT), while 15% were identified as introduced species. Ecologically important species such as *Vitex parviflora* (Molave) and *Swietenia macrophylla* (Mahogany) were also documented within the campus. Their presence highlights the potential role of the campus as a refuge for ecologically valuable native and introduced plant species.

Conclusion - Although most plant species documented within the campus are not currently threatened, the occurrence of vulnerable and endangered species emphasizes the need for appropriate conservation measures. Without proper management, habitat disturbance, campus development, and competition from introduced species may threaten ecologically significant plants.

Recommendations - The university should establish designated conservation areas within the campus to protect ecologically important species and their habitats. Furthermore, the establishment of a native plant nursery may support conservation initiatives, ecological restoration, and biodiversity-related educational activities.

4.4 *Contribution of the Floristic Inventory to Biodiversity Conservation, Education, and Sustainable Land-Use Planning*

Findings - The floristic inventory conducted within the Central Bicol State University of Agriculture provides baseline information on plant diversity, species composition, and ecological distribution. The generated data can support biodiversity conservation initiatives, environmental education, and sustainable land-use planning within the campus. The documented plant diversity also demonstrates the campus's potential to function as a living laboratory for ecological learning, allowing students and researchers to engage in field-based studies, biodiversity assessments, and long-term ecological monitoring. Moreover, the findings can assist university administrators in making informed decisions regarding campus landscaping and infrastructure development while minimizing adverse impacts on existing vegetation and ecological resources.

Conclusion - The floristic inventory demonstrates that CBSUA–Pasacao Campus possesses valuable plant biodiversity that contributes to environmental education, ecological research, and sustainable campus management. Integrating biodiversity information into institutional planning can help balance campus development with environmental conservation objectives.

Recommendations - The university should incorporate the findings of this study into its environmental management and sustainability programs. Educational initiatives such as plant identification guides, biodiversity signage, and field-based ecological activities should also be implemented to enhance environmental awareness among students and faculty members. Additionally, periodic floristic monitoring is recommended to assess changes in plant diversity and ecosystem health over time.

Practical Educational Implications - The findings of this floristic inventory provide several practical implications for education, biodiversity conservation, and campus management within Central Bicol State University of Agriculture and similar academic institutions. For teachers and researchers, the documented plant diversity may serve as a valuable instructional and research resource for biology, ecology, environmental science, agriculture, and conservation-related courses. The campus vegetation can function as a living laboratory where students may conduct field identification, ecological assessment, biodiversity monitoring, and habitat analysis activities. Integrating actual campus biodiversity into instruction can strengthen experiential and place-based learning approaches.

For students, the inventory promotes environmental awareness and appreciation of local biodiversity. Exposure to native, introduced, ornamental, and ecologically significant plant species may enhance students' understanding of ecological relationships, conservation principles, and sustainable environmental practices. Field-based learning activities derived from the study may also improve scientific observation, critical thinking, and research skills. For school administrators and campus planners, the findings provide baseline ecological information that may guide sustainable land-use planning, landscaping, and environmental management programs. The inventory may support the development of biodiversity-friendly policies, conservation zones, native tree planting programs, and ecological restoration initiatives within the campus. Furthermore, integrating biodiversity conservation into institutional planning may help balance infrastructure development with environmental sustainability. More broadly, the study highlights the importance of higher education institutions as contributors to biodiversity conservation and environmental education. By maintaining and monitoring campus vegetation, schools can support ecological sustainability while providing meaningful opportunities for environmental learning and community engagement.

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Kamalayan ng mga mag-aaral sa tuntunin sa wastong paggamit ng bantas

Mesias, Jovan D. ✉

Leyte Normal University, Philippines (1905695@lnu.edu.ph)

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Abstract

Punctuation is not a design in written text, but it plays a significant role in the overall function of the output because it completes the idea that the sender wants to convey. It also serves as a guide to the true meaning of the message. Hence, it is imperative to have adequate awareness of the rules for correct punctuation usage. However, one of the challenges teachers face inside the classroom is the frequent incorrect use of punctuations by students. From that, a descriptive-quantitative study was conducted to 155 senior high school students from one of the public high schools in Dulag, Leyte, selected through stratified sampling. The study aims to determine the reading materials they read, their reasons for reading, and their level of awareness on the rules for correct usage of punctuations based on the Commission on Official Languages Manual. Results of the study revealed that most student respondents read newspaper articles, with broadening their knowledge being the primary reason for reading. It was also found out in the study that student respondents were aware of 10 punctuations, while they were moderately aware of 6 punctuations. The study recommends that teachers should encourage their students to read more materials to become more familiar with the sentence structure, and the use of punctuations. Additionally, further studies should be conducted to determine the relationship between the frequency of reading resource materials and awareness of correct punctuation usage.

Keywords: reading materials, reading, awareness, rules, punctuation

Kamalayan ng mga mag-aaral sa tuntunin sa wastong paggamit ng bantas

1. Abstrak

Ang bantas ay hindi lamang disenyo sa mga sulatin, kundi ito ay nagtataglay ng mahalagang papel sapagkat kinokompleto nito ang pangkalahatang ideyang nais ihayag. Nagsisilbi rin itong giya sa tunay na kahulugan ng mensahe. Samakatuwid, kinakailangang magkaroon ng sapat na kamalayan sa wastong paggamit nito. Subalit, isa sa mga hamong kinahaharap ng mga guro sa klase ay kalimitang pagkakamali sa wastong paggamit ng bantas. Kaya, isang deskriptib-kwantitatib na pag-aaral ang isinagawa sa 155 na mga mag-aaral ng baitang 11 at 12 sa isa sa mga mataas na pampublikong paaralan ng bayan ng Dulag, Leyte, na pinili gamit ang *stratified sampling*. Nilayon ng pag-aaral na ito na alamin ang mga babasahing binabasa ng mga mag-aaral, dahilan ng kanilang pagbabasa, at ang kanilang antas ng kamalayan sa tuntunin sa wastong paggamit ng bantas batay sa Komisyon sa Wikang Filipino (KWF) Manwal sa Masinop na Pagsulat. Resulta sa pag-aaral na ito ay nagpapakita na maraming respondenteng mag-aaral ang nagbabasa ng artikulo sa pahayagan. Pagpapalawak ng kaalaman naman ang pinakadahilan ng kanilang pagbabasa. Natuklasan din ng pananaliksik na sila ay may kamalayan sa 10 bantas habang may katamtamang kamalayan naman sa 6 bantas batay sa libro ng KWF. Mula rito, inirerekomenda ng mananaliksik na mas lalong hikayatin ang mga mag-aaral na magbasa ng mga babasahin upang mas maging pamilyar sa estruktura ng pangungusap at pagkakabuo nito. Magsagawa rin ng pag-aaral upang suriin ang relasyon ng dalas ng pagbabasa sa mga babasahin at antas ng kamalayan sa wastong paggamit ng bantas.

Susing salita: babasahin, pagbasa, kamalayan, tuntunin, bantas

2. Introduksiyon

Isinasaad sa pangkalahatang layunin ng *K-12 Curriculum* ay makalinang ng isang buo at ganap na Pilipinong may kapaki-pakinabang na literasi. Kaya, kailangang malinang at mahubog ang mga mag-aaral sa pangunahing kasanayan tulad ng pagsulat. Isa sa napakahalagang kasanayan na dapat magkaroon ang isang mag-aaral ay ang kasanayan sa pagsulat sapagkat sa pagsulat ay kailangang marunong sa paggamit hindi lamang ng mga salita, kundi sa paggamit din ng bantas. Binanggit nina Arquiola et al. (2022) sa kanilang papel pananaliksik na ang pagsulat ay isa sa mga napakahalagang kasanayang dapat madebelop ng isang tao. Samakatuwid, kinakailangang magkaroon ng mataas na kasanayan hindi lamang sa estruktura ng pangungusap, kundi pati na rin paano ang wastong paggamit ng mga bantas.

Subalit, hindi maipagkakailang marami ang nalilito sa wastong paggamit ng mga ito at kalimitang marami ang nagkakamali rito. Binigyang-diin ng *Philippine Revolution Web Central* (2023) na ang pagkakaroon ng mababang kasanayan ng mga mag-aaral sa makrong kasanayang pagsulat ay hamon sa pagtatamo ng isinasaad na layunin ng *K-12 Curriculum*. Sa katunayan, sa pag-aaral na isinagawa ni Alhusban (2016), natuklasang maraming kabataan ang hindi marunong sa kahalagahan ng tamang paggamit ng bantas sa pagsulat. Isa sa mga mahalagang salik na nakaaapekto rito ay ang pagpasok ng teknolohiya na unti-unti nang nagbubunsod ng paglimot sa wastong paggamit ng bantas.

Parehong resulta ang natuklasan sa pag-aaral nina Ibañez at Bruma (2025) na kung saan sinuri nila kung paano ginagamit ng mga mag-aaral ng baitang 10 ng *Celestino G. Tabuena Memorial National High School*, Lungsod ng Sorsogon ang mga salita sa sosyal midya. Sa pananaliksik nila ay natuklasan na ang mga mag-aaral ay may hindi sapat na kaalaman sa paggamit ng wastong bantas. May pagkakamali rin sa antas ng pormalidad ng wikang gamit, may kalituhan sa pagbabaybay at may pagkakamali sa payak na pangungusap na hindi organisado ang nilalaman nito.

Sinuri naman sa pag-aaral ni Gabatino (2026) ang mga sintaktikal na pagkakamali sa mga sanaysay na mapanghikayat ng 50 mag-aaral ng baitang 10 na kabilang sa *Cookery at Information and Communication*

Technonology (ICT) ng Doña Francisca Lacsamana De Ortega Memorial National High School, Lungsod ng La Union. Natuklasan sa pag-aaral na ito na ang karaniwang pagkakamali sa kanilang mga sulatin ay maling gamit ng salita, nakalilimutang paglalagay ng mga bantas, maling ayos ng pangungusap at *subject-verb agreement* na pagkakamali. Napag-alaman pa ng pag-aaral na ang pinakamalaking salik sa mga suliraning ito ay kakulangan ng *exposure* sa mga akademikong sulatin. Kaya, isa sa mga rekomendasyon ng pag-aaral ay bigyan ng mas marami pang babasahin ang mga mag-aaral.

Isa pang pag-aaral ukol sa pagsusuri sa karaniwang kamalian sa sanaysay na mapanghikayat ang isinagawa naman ni Luchina (2026). Subalit, ang pokus naman sa kanyang papel pananaliksik ay gramatikal na kamalian sa mga awtput na sulatin ng mga mag-aaral ng baitang 10 ng *Baringcucurong National High School*, Bayan ng Suyo, Ilocus Sur. Resulta ng pag-aaral ay nagpapakita na mula sa 68 sanaysay na mapanghikayat na may 150-200 salita, ang pinakaulit-ulit na pagkakamali ay una ang maling paggamit ng mga salita, sinundan ng maling paggamit ng *preposition* at *article*. Kasunod dito ang maling paggamit ng mga bantas lalo na ang kuwit, tuldok, gitling at tutuldok.

Sa kabilang banda, sa isinagawang *metadiscourse* sa mga akademikong sulatin ng mga mag-aaral ng *senior high school* ng Area IV, Dibisyon ng Batangas na kung saan may 54 kaguruang tumugon sa sarbey kwestyuner na may sariling gawang rubrik ng mananaliksik, natuklasan mula sa posisyong papel, abstrak, at konseptong papel ng mga mag-aaral sa Ingles na klase, ang kadalasang pagkakamali ay gramatika at paggamit ng bantas lalo na pagdating sa transisyon ng mga pangungusap (De Castro, 2022). Sa pagsusuri naman sa kalimitang kamalian sa liham pangangalakal ng mga mag-aaral, napag-alamang ang komon na pagkakamali rito ay ang paggamit ng mga karaniwang bantas tulad ng tuldok at kuwit. Sinundan ito ng pagkakamali sa *subject-verb agreement*, pagbabaybay, *capitalization* at *contraction* ng mga salita (Gomez, 2022).

Ang mga kahinaang ito ay masasalamatin din sa mga internasyunal na pagtataya. Sa katunayan, sa pagsusulit ng *Programme for International Student Assessment (PISA)*, nasa rank 76 sa 81 bansa ang Pilipinas sa *reading comprehension*, *Math at Science* (Marcelo, 2025). Makikita rito ang mababang antas ng mga mag-aaral na Pilipino at nahuhuli sa mga karatig-lugar nito. Sa pag-aaral naman ni Misa (2021) ukol sa kakayahang panggramatika sa Filipino ng mga mag-aaral ng baitang 9 sa *Laboratory High School* ng *President Ramon Magsaysay State University*, natuklasang *developing* o papaunlad pa lamang ang antas ng kakayahan ng mga respondenteng mag-aaral sa wastong paggamit ng salita, ayos ng pangungusap, pagbuo ng pangungusap at mekaniks lalo na sa paggamit ng bantas.

Sa kabilang banda, sa isinagawang pag-aaral naman nina Sevilla et al. (2026) ukol sa pagsusuri sa kahusayan ng mga mag-aaral sa baitang 11 ng *AB Advanced Colleges, Incorporated*, Lungsod ng Tarlac, resulta ng pag-aaral ay nagpapakita na sa 60 respondente na pinili gamit ang *stratified sampling*, may masteri ang mga respondenteng mag-aaral sa tuldok (87.44%), panipi (83.33%), at kuwit (76.67%). Habang may katamtamang masteri naman sa kudlit (63.33%). Gitling naman ang may pinakamababang *mean percentage score* (37.50%) na nagpapakita ng mababang masteri sa paggamit nito. Natuklasan pa sa pananaliksik na sa *item-level analysis*, may mahinang perormans sa piling bantas tulad ng tandang padamdang at gitling.

Binanggit naman nina Espiritu at Laguarda (2019) sa kanilang papel pananaliksik ukol sa antas ng pag-unawa ng mga mag-aaral ng baitang 7 ng *Looc Integrated School*, Lungsod ng Calamba, Laguna sa wastong paggamit ng mga piling bantas mula sa Komisyon sa Wikang Filipino (KWF), resulta ng pag-aaral ay nagpapakita na ang mga mag-aaral ay may mataas na kaalaman sa paggamit ng bantas lalo na ang tuldok na may pinakamataas na *mean* na 4.06. Kuwit, tutuldok, gitling, panaklong, at ellipsis naman ay pare-parehong ikalawang pinakamataas na may kaalaman. Habang may katamtamang kaalaman naman sa tuldok-kuwit, at gatlang na kung saan pareho silang ikatlong may pinakamataas na kaalaman sa bantas batay sa instrumentong ginamit ng mananaliksik.

Kung papansinin naman sa pananaliksik na isinagawa ni Gonzales (2019) sa 171 mag-aaral ng baitang 7 mula sa tatlong (3) pangkat ng *special science class* at dalawang (2) *regular class* ng *Pampanga High School* na kung saan sinuri niya ang mga gawaing pasulat ng mga mag-aaral batay sa Binagong Gabay sa Ortograpiya ng Wikang

Filipino, lumabas sa resulta na ang unang kamalian sa gawaing pasulat ng mga mag-aaral ay maling paggamit ng mga bantas tulad ng tuldok, kudlit, at gitling. Sa gawaing pasulat ng mga mag-aaral ay may nakitang paulit-ulit na pagkakamali tulad ng hindi paglalagay ng tuldok sa hulihang pangungusap. Habang may mga salitang dapat lagyan ng gitling ay hindi nilalagyan, at may mga hindi dapat lagyan ay nilalagyan ng gitling. Isa pa, may mga salitang hindi nilalagyan ng kudlit na dapat lagyan kung pinaikli.

Pinatunayan pa ng pagtataya ng Departamento ng Edukasyon na maraming mag-aaral na Pilipino ang nahihirapan sa mga konsepto ng gramatika kabilang na ang bantas. Sa katunayan, ayon kina Benoman et al. (2025), ang pangunahing hamon ng mga mag-aaral sa gramatika ay dahil sa labis na pagdepende sa *spell-checker*, maling paggamit ng panlapi at hindi tamang paglalagay ng mga tuldok at kuwit. Binanggit naman sa papel pananaliksik nina Bante et al. (2024) na nakababahala ang kahinaan sa pagsulat kabilang na ang tamang paggamit ng bantas. Kailangang tandaan na kung walang pagbabantas ay hindi makapagbibigay ng tiyak na katangian ng pananalita at nais ihayag (Busacay et al., 2025). Kaya, binigyang-diin ng KWF na kailangan ang bantas para sa malinaw na pagpapahayag ng mga kaisipan at tiyak na layunin (Almario, 2014). Sinang-ayunan naman ito nina Jimmy at Germain (2025) na ang maling bantas ay maaaring makasagabal sa daloy ng kaisipan at makapagpabago ng kahulugan nito sapagkat mahalaga ang papel ng mga bantas upang mabuo ang kabuoang nais ihayag.

Sa pangkalahatan, masasabing ang mababang antas ng kamalayan sa wastong paggamit ng bantas ay nagreresulta naman sa mababang kasanayan sa pagsulat gamit ang mga bantas. Kailangang tandaan din na ang kasiningan ay hindi buo kung walang kawastuhan ang pangungusap na ang prinsipyo ng kawastuhan ay nakasalalay naman sa tamang estrukturang panggramatika kabilang ang mga bantas. Sa lokal na konteksto ng bayan ng Dulag, Leyte, isa sa mga kinahaharap na hamon ng mga guro sa hayskul ay ang kalimitang pagkakamali ng mga mag-aaral sa wastong paggamit ng bantas. Kahit sa simpleng pagbuo ng mga sulatin ay kadalasang maraming pagkakamali kahit sa pinakakaraniwang bantas tulad ng tuldok at kuwit. Ito ay nagpapakita lamang ng suliranin sa aspektong ito na dapat ay natutugunan na sapagkat sila ay nasa mas mataas na lebel na pag-aaral. Kaya, nilayon ng pag-aaral na ito na alamin ang antas ng kamalayan ng mga mag-aaral sa *senior high school* ng isa sa mga paaralan ng bayan ng Dulag, Leyte sa tuntunin sa wastong paggamit ng bantas batay sa mga bantas at tuntuning tinipon sa libro ni Almario (2014) na Komisyon sa Wikang Filipino (KWF) Manwal sa Masinop na Pagsulat. Ang mga tuntuning kalakip sa nabanggit na libro ay mula sa mga tinipong gabay paano gamitin ang isang bantas.

Sa pagdaragdag, nilayon din ng mananaliksik na alamin ang mga babasahing binabasa ng mga mag-aaral at ang kanilang dahilan ng pagbabasa rito. Ninais din ng mananaliksik na isagawa ang pag-aaral na ito na naglalayong alamin ang antas ng kamalayan sa lahat ng mga tinipong bantas sapagkat mula sa mga nailahad na literatura at pag-aaral sa itaas, mahihinuhaing kalimitan ng mga pag-aaral ay nakatuon lamang sa pagsusuri ng mga sulatin at awtput ng mga mag-aaral, maging sanaysay na mapanghikayat man at iba pang akademikong sulatin ukol sa kanilang kasanayan, kahusayan, at kaalaman sa paggamit ng mga bantas. Hindi dapat nakatuon lamang ang mga pag-aaral sa kung ano na ang nabuo ng mga mag-aaral sa loob ng klasrum, kundi kinakailangan ding masuri muna ang batayang kamalayan o *awareness* ng mga mag-aaral sa lahat ng mga tuntunin sa paggamit ng isang tiyak na bantas lalo pa at malaking bahagi ang pagkakaroon ng kamalayan tungo sa kaalaman naman sa paggamit nito sa pagbuo ng pangungusap.

Isa pang nakita ng mananaliksik na kailangang tugunan sa mga naunang pag-aaral ay nakatuon sila sa mas mababang lebel tulad ng baitang 7, 10 at maging 11 subalit walang naging mga pag-aaral na naglalayong suriin ang antas ng kamalayan ng mga mag-aaral sa *senior high school* kabilang ang baitang 12 na lubhang mahalaga sapagkat sila ay tutuntong na sa kolehiyo. Ang resulta ng pag-aaral na ito ay maaaring makatulong sa mga guro lalo na sa mga humahawak ng asignaturang Ingles at Filipino upang magabayan sila sa pagpapanatili ng mataas na kamalayan sa paggamit ng bantas. Makatutulong din ito sa kanila upang masuri ang mga babasahing binabasa ng mga mag-aaral lalo na sa batayang aklat na ginagamit. Mula rito, makapagbibigay naman ito ng direksiyon upang makabuo ng iba't ibang mga programang pang-edukasyon upang mas maitaguyod ang wastong paggamit ng bantas kahit sa loob ng klasrum pa lamang.

Layunin ng Pag-aaral - Ang pag-aaral na ito ay naglalayong alamin ang antas ng kamalayan ng mga mag-aaral sa tuntunin sa wastong paggamit ng bantas. Partikular, nilalayong sagutin ang sumusunod na tanong:

- Ano-ano ang mga babasahing binabasa ng mga mag-aaral?
- Ano-ano ang mga dahilan ng pagbabasa ng mga mag-aaral?
- Ano ang antas ng kamalayan ng mga mag-aaral sa tuntunin sa wastong paggamit ng bantas?

3. Metodolohiya

Ang pag-aaral na ito ay gumamit ng deskriptib-kwantitatib na disenyo ng pananaliksik na kung saan ito ay nagkokolekta ng mga datos upang ilarawan ang mga *average*, at *trend* na nagbibigay ng kompletong larawan ng mga pangyayari sa isang panahon (Barrot, 2017). Ang mga respondente sa pag-aaral na ito ay mga mag-aaral ng baitang 11 at 12 na may *strand* na *Humanities and Social Sciences (HUMSS)*, *Accountancy and Business Management (ABM)*, at *Cookery* sa isa sa mga mataas na pampublikong paaralan ng bayan ng Dulag, Leyte na may kabuoang bilang ng populasyon na 258 na kung saan may 118 na mag-aaral sa baitang 11 at 140 naman sa baitang 12. Ginamit ang *Raosoft sample size calculator* kaya mayroong 155 na bilang ng sampol ng mga respondente na pinili naman sa pamamagitan ng paggamit ng *stratified sampling* upang magkaroon ng *proportional number* sa bawat grupo. Natukoy na sa mga respondente ay may 71 na baitang 11 at 84 naman sa baitang 12. Ginamit ng mananaliksik ang *structured* na sariling gawang kamalayan sa tuntunin sa wastong paggamit ng bantas *questionnaire* sa pangangalap ng datos na kung saan ito ay binubuo ng apat (4) na bahagi. Ito ay sinuri ng tatlong (3) mga eksperto at dumaan din sa *pilot testing* na kung saan ang resulta sa *Cronbach's alpha* para sa bahagi ng kamalayan sa wastong paggamit ng bantas ay 0.93 o *excellent*. Kinolekta naman ang mga datos noong ika-23 at 24 ng Marso 2026. Sa pag-analisa ng mga datos ay ginamit ng mananaliksik ang iba't ibang estadistika. Para sa una at ikalawang layunin ay ginamit ang *frequency count at percentage*. Para naman sa ikatlong layunin ay ginamit ang *mean score at standard deviation*. Ginamit naman ng mananaliksik ang *mean score* na halaw kay Pimentel (2019) para sa pag-analisa ng antas ng kamalayan sa tuntunin sa wastong paggamit ng bantas. Ang *interval* na 1.00 – 1.79 ay may interpretasyon bilang walang kamalayan. Habang ang 1.80 – 2.59 naman ay may kaunting kamalayan. Ang 2.60 – 3.39 ay may katamtamang kamalayan. Samantala, ang 3.40 – 4.19 naman ay may kamalayan, at ang 4.20 – 5.00 ay may mataas na antas ng kamalayan. Ang lahat ng estadistikang ginamit ng mananaliksik ay ipinabalideyt sa isang *Statistician* na kasalukuyang nagtatrabaho sa *Dalian American International School*, Dalian, China bilang guro ng Matematika at may doktoradong digri na *Doctor of Philosophy in Social Science Research*. Ang mananaliksik ay sumunod sa lahat ng etikal na konsiderasyon lalo na sa pangangalap ng datos kaya walang sinuman ang nalagay sa peligro o kapahamakan. Lahat ng mga nakolektang datos ay pinag-ukulan ng may mataas na *confidentiality*, at ginamit ng mananaliksik para sa layunin ng pag-aaral lamang.

4. Resulta at Pagtalakay

4.1 Mga Babasahing Binabasa ng mga Mag-aaral

Ang pagbabasa ay isa sa mga makrong kasanayang dinedebelop ng bawat indibidwal. Sa isang araw na pamumuhay ng tao ay ginugol niya ang 15% na oras sa pagbabasa (Macarandan et al., 2023). Sa karamihan, ang pagbabasa ay isa nang bahagi ng kanilang gawain. Ayon sa *Faith Christian School* (2025), ang pagbabasa ay hindi lamang isang kasanayan, kundi isa sa mga salik sa tagumpay ng isang tao. Ito ay isang holistikong paraan ng pagdeblop. Sa pananaliksik na ito ay pinag-aralan ang mga babasahing binabasa ng mga mag-aaral kung saan ito ay nakahanay batay sa mga uri ng babasahin. Sa apat (4) na uri ng babasahing nasarbey ng mananaliksik, makikita mula sa talahanayan 1 na artikulo sa pahayagan ang may pinakamataas na bilang na may 128 o 83% sa kabuoang bilang ng respondente ang bumabasa nito.

Talahanayan 1***Mga Babasahing Binabasa ng mga Mag-aaral***

Mga Babasahing Binabasa ng mga Mag-aaral	Uri ng Babasahin	Frequency Count <i>N</i> = 155	Percentage
Artikulo sa pahayagan	Pampubliko at Pahayagan	128	83%
Batayang aklat	Akademikong Babasahin	115	74%
Post sa sosyal midya	Onlayn na Babasahin	110	71%
Akdang pampanitikan	Panlibangan	94	61%
Artikulo sa <i>internet</i>	Onlayn na Babasahin	74	48%
Magasin	Panlibangan	64	45%
Papel pananaliksik at dyornal	Akademikong Babasahin	56	36%
<i>E-book</i> at magasin sa onlayn	Onlayn na Babasahin	38	25%
Sanayang aklat	Akademikong Babasahin	31	20%
<i>Blog</i>	Onlayn na Babasahin	27	17%
Sangguning aklat	Akademikong Babasahin	21	14%
<i>Broadsheet</i>	Pampubliko at Pahayagan	21	14%
<i>Tabloid</i>	Pampubliko at Pahayagan	17	11%

Note. Maaaring lumagpas sa 100% ang kabuoang porsyento dahil maaaring pumili ng higit sa isang sagot ang mga respondente

Sinundan naman ito ng batayang aklat na may 115 o 74%. Binabasa rin ng mga mag-aaral ang mga *post* sa soyal midya na may 110 o 71%. Sunod pa nito ang akdang pampanitikan na may 94 o 61%. Mayroon namang 74 o 48% na nagbabasa ng artikulo sa *internet* habang sa magasin naman ay may 64 o 45%. Sa pagdaragdag, makikita pa sa talahanayan na may 56 o 36% na mga respondente ang nagbabasa ng papel pananaliksik at dyornal. Mayroon namang 38 o 25% ang nagbabasa ng *e-book* at magasin sa onlayn. Habang may 31 o 20% ang nagbabasa ng sanayang aklat. Mayroon namang 27 o 17% ang nagbabasa ng *blog*. Sa sangguniang aklat at *broadsheet* ay parehong may 21 o 14% na mga respondente ang nagbabasa. Ang *tabloid* naman ay may 17 o 11% ang nagbabasa sa lahat ng mga respondente.

Mula sa resultang ito, masasabi lamang na kahit sa kasalukuyang panahon na ang mga impormasyon ay madali nang mahanap gamit ang *internet*, hindi pa rin maipagkakailang nagbabasa ang karamihan sa mga nakalimbag na babasahin tulad ng artikulo sa pahayagan. Sa katunayan, ayon kay Dharmaraj (2025), datos mula sa pinakabagong sarbey sa literasi, edukasyon, at gawain sa midya sa mga naninirahan sa Silangang Bisayas ay nagpapakita na kahit may pababa ng numero sa mga nagbabasa sa mga nakalimbag na balita mula sa 28.9% noong 2019 na naging 19.5% na lamang noong 2024 sa mga lugar na may limitadong akses sa *internet* dahil sa mahinang signal ay hindi pa rin nawawala ang pagtangkilik sa mga nakalimbag na balita.

Sa kabilang banda, sa ibayong dagat naman lalo na sa Amerika kung saan, isa ito sa mga bansang may malawak na akses sa *internet*, ang mga mag-aaral ay mas nagbabasa sa mga *digital* na babasahin. Binigyang-diin ng *Pew Research Center* na ang mga batang mambabasa ay pinagtutuonan ng pansin ang mga nasa onlayn kaysa sa mga nakalimbag na babasahin (Spinner, 2024). Sa sarbey naman na isinagawa nina Shahzad et al. (2023) sa 244 na mga mag-aaral ng komunikasyon at midya sa Unibersidad ng Lahore, Punjab, Pakistan, natuklasang may 67% na mga respondente ang pabor sa mga onlayn na balita at 33% naman sa mga artikulo sa pahayagan. Napag-alaman pa na ang rason sa pagpili ng onlayn na balita ay dahil sa abot-kaya ito ng karamihan.

Sa pagdaragdag, masusuri pa sa resulta ng pag-aaral na ito na halos karamihan sa mga respondente ay nagbabasa ng mga nakalimbag na babasahin kaysa sa mga nasa onlayn dahil kasunod ng artikulo sa pahayagan ay batayang aklat. Ayon sa pag-aaral nina Saadillah et al. (2023), natuklasan sa kanilang pag-aaral na sa 26 na mga mag-aaral ng ika-12 baitang ng Tanah Laut Indonesia ay may 11 mag-aaral ang nagbabasa ng batayang aklat, may 6 na nagbabasa ng *e-book*, may 5 na nagbabasa ng *Wattpad* at 4 na nanonood sa *Youtube*. Mula sa resulta ng pag-aaral, masasabi lamang na malaki rin ang salik na ginagampanan ng koneksiyon sa *internet* at heograpiya ng lugar sa babasahing binabasa ng mga mag-aaral.

4.2 Mga Dahilan ng Pagbabasa ng mga Mag-aaral

Ang pagbabasa ay mahalagang makrong kasanayan dahil hindi lamang nito nililina ang kognitibong aspekto ng tao, kundi pinaunlad din nito ang kabuoang aspekto ng proseso ng pamumuhay ng tao (Jardin, 2026). Isa pa,

binigyang-diin din ng *National Library of New Zealand* (2026) na ang pagbabasa ay may mga benepisyo sa malawak na saklaw tulad ng pag-unlad ng literasi, kasanayang pansosyal, kalusugan at inaasahang pagkatuto.

Talahanayan 2

Mga Dahilan ng Pagbabasa ng mga Mag-aaral

Mga Dahilan ng Pagbabasa ng mga Mag-aaral	Pangkalahatang Dahilan ng Pagbasa	Frequency Count <i>N</i> = 155	Percentage
Pagpapalawak ng kaalaman	Pang-edukasyunal na Dahilan	101	65%
Maging maalam sa nagaganap	Pampersonal na Dahilan	93	60%
Pampalipas-oras	Pampersonal na Dahilan	79	51%
Paghahanda sa klase/pagsusulit	Pang-edukasyunal na Dahilan	73	47%
Bahagi ng takdang-aralin	Pang-edukasyunal na Dahilan	71	46%
Kahiligang magbasa	Pampersonal na Dahilan	51	33%

Note. Maaaring lumagpas sa 100% ang kabuoang porsyento dahil maaaring pumili ng higit sa isang sagot ang mga respondente

Sa pag-aaral na ito ay inalam ang mga dahilan ng pagbabasa ng mga respondenteng mag-aaral na kung saan, batay sa sarbey ay inuri ang mga dahilang ito sa dalawang (2) malawak na saklaw ng dahilan ng pagbabasa, ang pang-edukasyunal at pampersonal na dahilan. Mapapansin sa talahanayan 2 na ang pinakadahilan ng pagbabasa ng mga respondenteng mag-aaral ay pagpapalawak ng kaalaman na may 101 o 65% sa kabuoang 155 na sampol. Sunod dito ang maging maalam sa nagaganap na may 93 o 60%. Habang 79 o 51% naman ang nagbabasa dahil ito ay bilang pampalipas-oras nila. May 73 o 47% naman ang nagbabasa para sa paghahanda sa klase o pagsusulit, at sa bahagi ng takdang-aralin ay may 71 o 46%. Mayroon namang 51 o 33% ang nagbabasa dahil kahiligan nilang magbasa.

Mahihinuha lamang sa resultang ito na ang dahilan ng pagbabasa ng mga respondenteng mag-aaral ay nakatuon sila sa pagkuha ng mas malawak na kaalaman. Sa naunang resulta ukol sa babasahing binabasa ng mga mag-aaral ay natuklasan na ang binabasa nila ay artikulo sa pahayagan at kasunod dito ang batayang aklat. Masasabi lamang dito na ang mga respondenteng mag-aaral ay tunay na nagbabasa upang makakuha ng mahahalagang impormasyong magagamit nila. Ang resulta ng pag-aaral na ito ay kahalintulad sa binanggit ni Walburg (2020) sa kanyang artikulo na ang mga tao ay nagbabasa dahil sa iba't ibang dahilan. Isa sa mga dahilang ito ay nagbabasa sila upang makakuha ng mga kaalaman, maging maalam sa nagaganap, pansariling kasiyahan o makasabay sa *trend*.

Binanggit din ng *Centre for Adult Education* (2026) na ang pinakaunang dahilan ng pagbabasa ng karamihan ay dahil sa pagnanais na makakuha ng kaalaman lalo pa na karamihan sa mga taong nagtatagumpay tulad nina Elon Musk, Bill Gates, at iba pa ay mahilig magbasa. Binigyang-diin naman ni Durham (2025) sa kanyang artikulo na may mga benepisyo sa pagbabasa tulad ng nagpapaunlad ito ng pakikipagkapuwa-tao, pag-iisip, nagpapalawak ng kaalaman, at pagkamalikhain, nagdedebelop ng kognitibong pagganap, at nakatutulong na maiwasan ang sakit na *dementia*. Mula sa mga impormasyong ito, masasabi lamang na may iba't ibang dahilan ng pagbabasa ang bawat tao. Ngunit, sa kabuoan ay anuman ang dahilan ng pagbabasa ay naglalayon ito ng magandang benepisyo sa anumang edad ng taong nagbabasa.

4.3 *Antas ng Kamalayan ng mga Mag-aaral sa Tuntunin sa Wastong Paggamit ng Bantas*

Ang paggamit ng bantas ay mahalaga sapagkat mas napalilina nito ang nais ipahayag. Kinokompleto rin nito ang kabuoang diwa ng isang mensahe (Isaqov & Durdonahan, 2022). Binanggit ng *Charlesworth Author Services* (2020) na ang paggamit ng wastong bantas ay nagbibigay ng magandang impresyon sa kwaliti ng papel. Isa pa, ang pagkakaroon ng kamalayan paano gamitin nang maayos ang mga bantas ay hindi lamang nakatuon sa katotohanang ito ay pinakakaraniwang kaalaman, kundi ang paggamit ng wastong bantas ay giya ng mambabasa sa ideyang nais bigyang-diin sa pangungusap (*University of Reading*, 2026). Ayon naman kay Escudra (2022), mahalagang bahagi sa mekaniks ng pagsulat at may malaking impluwensiya sa organisasyon at kalinawan ng ideya ang tamang paggamit ng mga bantas.

Talahanayan 3***Antas ng Kamalayan ng mga Mag-aaral sa Tuntunin sa Wastong Paggamit ng Bantas***

Mga Bantas	Mean	Standard Deviation	Interpretasyon
1. Tandang Pananong	3.69	1.10	May Kamalayan
2. Ellipsis	3.62	1.24	May Kamalayan
3. Panipi	3.57	1.11	May Kamalayan
4. Panaklong	3.56	1.15	May Kamalayan
5. Kudlit	3.54	1.28	May Kamalayan
6. Panaklaw	3.53	1.26	May Kamalayan
7. Tandang Padamdang	3.51	1.12	May Kamalayan
8.5 Pahilig	3.50	1.17	May Kamalayan
8.8. Kuwit	3.50	1.12	May Kamalayan
10. Tuldok	3.43	1.19	May Kamalayan
11. Tutuldok	3.36	1.12	Katamtamang Kamalayan
12. Gatlang en	3.34	1.13	Katamtamang Kamalayan
13. Gitling	3.32	1.15	Katamtamang Kamalayan
14. Tuldok-kuwit	3.31	1.08	Katamtamang Kamalayan
15. Gatlang em	3.27	1.12	Katamtamang Kamalayan
16. Gatlang 3 em	3.18	1.19	Katamtamang Kamalayan
<i>Weighted Mean & Standard Deviation</i>	3.45	1.16	May Kamalayan

Sa pag-aaral na ito ay sinuri ang antas ng kamalayan ng mga mag-aaral sa iba't ibang bantas batay sa Komisyon sa Wikang Filipino Manwal sa Masinop na Pagsulat. Makikita sa talahanayan 3 na sa 16 na bantas, may sampung (10) bantas na may kamalayan ang mga respondenteng mag-aaral at may anim (6) namang bantas na katamtaman lamang ang kanilang kamalayan. Kung susuriin pa sa talahanayan na tandang pananong ang may pinakamataas na *value* sa lahat ng mga bantas na may 3.69 na *mean* na ibig ipakahulugan ay may kamalayan. Kung papansinin pa ang *standard deviation* nito, mahihinuha lamang na isang puntos ang layo ng sagot ng bawat respondente sa *mean* na 3.69. Ang resultang ito ay hindi maipagkakailang alam na alam ng mga mag-aaral ang tandang pananong sapagkat ayon kina Borge at Bradley (2026), ang kuwit, tandang pananong, tandang padamdang at tuldok ay mga pinakakaraniwang bantas. Kaya, hindi maipagkakailang sa resulta sa talahanayan ay may kamalayan ang mga respondenteng mag-aaral sa nabanggit na mga bantas. Kasama rin dito ang mga bantas na ellipsis, panipi, panaklong, kudlit, panaklaw, at pahilig ayon sa pagkakasunod-sunod batay sa talahanayan.

Sa kabilang banda, may katamtamang kamalayan naman ang mga respondenteng mag-aaral sa bantas na tutuldok, gatlang en, tuldok-kuwit, gatlang em at gatlang 3 em ayon sa pagkakasunod-sunod. Mapapansin na ang mga ito ay hindi gaanong alam at kilala ng mga mag-aaral lalo na ang gatlang 3 em. Ngunit sa kabuoan, ang antas ng kamalayan ng mga respondenteng mag-aaral ay may kamalayan na may 3.45 na *mean*. Kung papansinin pa ang *standard deviation* nito, may isang puntos ang layo ng sagot ng bawat respondente sa *mean* na nabanggit. Masasabi pa na ang mga respondenteng mag-aaral ay bagaman may katamtamang kamalayan sa ibang bantas, sila ay may pundasyon sa pinakakaraniwang bantas na dapat alam nila. Ang resultang ito ay pareho sa resulta sa isinagawang pag-aaral nina Magno et al. (2025) na ang mga mag-aaral sa baitang 11 ng *Micro Asia College of Science and Technology Inc.* ay may *very satisfactory* na kaalaman sa paggamit ng wastong bantas.

Sa pagdaragdag, sa 30 respondenteng mag-aaral, may 2 na nakakuha ng *outstanding*, may 18 na nasa *very satisfactory*, may 7 na kabilang naman sa *satisfactory* at 3 na *fairly satisfactory*. Sa resultang ito, malinaw lamang na karamihan sa mga mag-aaral ay may mataas hanggang sa katamtamang antas ng kamalayan sa wastong paggamit ng bantas. Sa kabilang banda, ayon naman sa pag-aaral nina Apuhin et al. (2023) ukol sa mga uri ng pagkakamali sa bantas at madalas na pagkakamali sa wastong paggamit ng bantas sa pagsulat ng sulating panghihikayat ng mga mag-aaral sa Ingles sa isa sa mga kolehiyo ng Negros Occidental, lumabas sa pag-aaral na ang kadalasang pagkakamali sa bantas ay ang nakaligtaang paglalagay ng bantas na may 67.7%, at kuwit naman ang may pinakamadalas na pagkakamali na may 77.4%.

Isa pang resulta ng pag-aaral ay nagpapakita naman na ang komon na pagkakamali sa impormatibong sulatin ng piling mga mag-aaral sa baitang 10 ng tatlong (3) paaralan sa Laguna ay *mechanical error*, *grammatical error* at *style error* na kung saan, sa *mechanical error* ay una ang pagkakamali sa bantas, kasunod ay ang baybay at ang *capitalization* (Esperanza et al., 2024). Parehong resulta ang ipinakita sa pag-aaral nina Sajid at Siddiqui (2018)

na ang pagkakamali sa bantas ay ang pinakalaganap na pagkakamaling makikita sa maraming mga sulatin ng mga mag-aaral sa Agham Panlipunan at *medical science*. Binanggit naman sa pag-aaral ni Altaeb (2025) na ang unang rason sa pagkakamali sa paggamit ng bantas ay dahil sa kakulangan sa pagtuturo ng bantas sa kurso ng Ingles lalo na sa mga libro ng mga mag-aaral ng Libya.

Mula rito, masasabing malaki rin ang ginagampanan kung pinalalakas ang pagtuturo ng mga bantas sa loob ng paaralan. Sisiguraduhin din ng mga guro na nasusuri nang maayos ang kaalaman ng mga mag-aaral sa wastong paggamit ng bantas. Sa kabuoan, masasabi lamang na ang mga respondenteng mag-aaral sa pananaliksik na ito na may kamalayan sila sa mga pinakakaraniwang bantas at may katamtamang kamalayan naman sa ilang mga bantas na hindi gaanong kilala ng karamihan.

5. Konklusyon

Mula sa isinagawang pagsusuri at analisis ng mga datos, natuklasan ng pag-aaral na ito na maraming respondenteng mag-aaral ang nagbabasa ng artikulo sa pahayagan na sinundan naman ng batayang aklat, *post* sa sosyal midya, akdang pampanitikan, artikulo sa *internet*, magasin, papel pananaliksik, at dyornal, *e-book*, at magasin sa onlayn, sanayang aklat, *blog*, sangguniang aklat, *broadsheet*, at *tabloid* ayon sa pagkakasunod-sunod. Ang pinakadahilan naman ng pagbabasa ng mga respondenteng mag-aaral ay para sa pagpapalawak ng kaalaman. Sinundan ito ng para maging maalam sa nagaganap. Sunod dito ang pampalipas-oras, paghahanda sa klase, at pagsusulit, bahagi ng takdang-aralin, at huli rito bilang dahilan sa pagbabasa ang dahil sa kahiligan nilang magbasa. Habang sa antas ng kamalayan naman sa tuntunin sa wastong gamit ng bantas batay sa libro ng KWF Manwal sa Masinop na Pagsulat ay natuklasang may kamalayan ang mga respondenteng mag-aaral sa tandang pananong, ellipsis, panipi, panaklong, kudlit, panaklaw, tandang padamdang, pahilig, kuwit, at tuldok. Ngunit, may katamtamang kamalayan lamang sa mga bantas tulad ng tutuldok, gatlang en, gitling, tuldok-kuwit, gatlang em at gatlang 3 em. Masasabi rito na hindi sila gaanong may kamalayan sa mga bantas na hindi kilala ng karamihan. Subalit, sa kabuoan ay may kamalayan ang mga mag-aaral sa lahat ng mga bantas na may 3.45 na *mean score* at 1.16 na *standard deviation*.

Rekomendasyon – batay sa resulta at konklusyon, inirerekomenda ng pag-aaral na ito na mas makabubuti kung mas hihikayatin ng mga guro ang mga mag-aaral na magbasa ng iba pang mga babasahin. Bigyan din ng mas marami pang mga babasahing mababasa ang mga mag-aaral sa loob ng klase, at maging sa mga *digital* na babasahin. Subalit, kinakailangang gabayan ang mga mag-aaral sa katotohanang hindi lahat ng nababasa sa onlayn lalo na sa *Facebook*, *Tiktok*, at iba pa ay wasto ang mga gamit na bantas kaya kailangan pa rin ng pag-verify sa katumpakan nito. Magsagawa rin ng mga pananaliksik na magsusuri sa mga babasahing kadalasang may kamalian lalo na sa paggamit ng mga bantas. Sa pagdaragdag, bagaman itinatuturo ang bantas sa mga paaralan, subalit mas makabubuti kung palalakasin pa ang pagtuturo sa mga tuntunin ng bawat bantas lalo na yaong mga hindi gaanong kilalang mga bantas upang mas maipakilala sa kanila ang mga ito.

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Enhancing phonemic awareness through interactive phonics games among kindergarten pupils

Caspe, Glinn ✉

Leyte Normal University, Philippines (Glinn935@gmail.com)

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Abstract

This study determined the effectiveness of interactive phonics games in enhancing the phonemic awareness of Kindergarten pupils at St. Scholastica's College Tacloban, Inc. during the School Year 2025–2026. Specifically, it assessed the pupils' level of phonemic awareness before and after the intervention, examined the significant difference between pre-test and post-test scores, and described pupils' engagement and learning experiences during the implementation of the activities. The study employed an action research design using purposive sampling to select Kindergarten pupils who required support in phonemic awareness skills. Data were gathered through a teacher-made phonemic awareness test, an observation checklist, and reflective journal entries. The intervention consisted of interactive phonics games implemented over a five-week period. Descriptive statistics such as mean and percentage were used to analyze the pupils' level of phonemic awareness, while a paired t-test determined the significance of the difference between pre-test and post-test scores. Qualitative data were analyzed thematically to describe pupils' engagement and learning experiences. Findings revealed that the pupils' mean score improved from 25.94 in the pre-test to 28.82 in the post-test, both interpreted as High. The computed t-value of 4.87 exceeded the critical t-value of 2.120, indicating a significant difference between the two sets of scores. The observation checklist yielded an overall mean of 2.79, interpreted as "Always Observed," indicating high engagement and participation. The study concludes that interactive phonics games effectively enhance phonemic awareness and promote active learning among Kindergarten pupils. It is recommended that teachers integrate interactive and play-based strategies in teaching early literacy skills to improve learners' reading readiness.

Keywords: phonemic awareness, interactive phonics games, Kindergarten pupils, early literacy, action research, sound blending

Enhancing phonemic awareness through interactive phonics games among kindergarten pupils

1. Introduction

The development of early literacy skills is a fundamental goal of the K–12 Curriculum, particularly during the early childhood years when foundational reading abilities are established. One of the most essential components of early literacy is phonemic awareness, which refers to the ability to hear, identify, and manipulate individual sounds in spoken words. This skill is considered a strong predictor of future reading success and is crucial in helping young learners become proficient readers. Research has consistently emphasized the importance of phonemic awareness in reading development. Adams (1990) explained that phonemic awareness enables learners to understand the relationship between sounds and printed letters, which is essential for decoding words. Similarly, Ehri (2005) found that children who develop strong phonemic awareness are more likely to read fluently and accurately. These findings suggest that phonemic awareness serves as a foundation upon which later reading comprehension and literacy skills are built. However, many young learners experience difficulties in recognizing and manipulating sounds, which negatively affects their reading development and academic progress.

In response to these challenges, educational researchers have explored various instructional approaches to strengthen phonemic awareness among young learners. Among these, play-based and interactive learning approaches have been identified as particularly effective in early childhood education. Piaget (1962) emphasized that children learn best through active engagement and play, while Vygotsky (1978) highlighted the importance of social interaction in cognitive development. These theoretical perspectives support the integration of interactive phonics games as meaningful tools for literacy instruction. Interactive phonics games provide opportunities for learners to actively participate in sound-based activities through movement, exploration, and collaboration. Such activities not only make learning enjoyable but also increase motivation and attention, which are essential factors in effective early literacy instruction. Torgesen (2002) found that systematic phonics instruction combined with engaging activities significantly improves learners' phonemic awareness and reading performance. This suggests that integrating interactive phonics games into classroom instruction can effectively address learners' difficulties in early reading.

In the Philippine context, challenges in early literacy remain evident. The Department of Education (2019) reported that many learners in the primary grades struggle with basic reading skills, particularly in phonics and sound recognition. This concern is further reflected in national and international assessments of literacy performance. The results of the Programme for International Student Assessment (PISA) showed that Filipino learners continue to face difficulties in reading comprehension and foundational literacy skills (Marcelo, 2025). These findings highlight the urgent need for effective and engaging instructional strategies that can address early literacy challenges in local classroom settings.

Recent educational efforts in the Philippines have emphasized the use of contextualized and learner-centered approaches to improve foundational reading competencies. Classroom-based interventions that incorporate play, interaction, and hands-on activities have shown promise in enhancing literacy outcomes among young learners. These approaches are especially relevant in Kindergarten classrooms, where learners benefit most from developmentally appropriate and experiential learning opportunities. Despite the availability of various teaching strategies, there remains a need for localized action research that examines the effectiveness of structured interactive phonics interventions among Kindergarten learners in Philippine schools. While previous studies have established the general benefits of phonics instruction, limited classroom-based research has specifically investigated how interactive phonics games influence the phonemic awareness of learners in Tacloban City. Furthermore, few studies have combined quantitative measures of phonemic awareness improvement with qualitative observations of learner engagement during play-based interventions.

What distinguishes this study is its implementation of a structured five-week interactive phonics intervention specifically designed for Kindergarten pupils in a Philippine private school context. Unlike broader phonics studies, this research focuses on three targeted skill areas: initial sound identification, letter-sound matching, and sound blending. It also integrates both statistical analysis and classroom observation to evaluate not only learners' academic progress but also their engagement and participation throughout the intervention.

In the researcher's classroom at St. Scholastica's College Tacloban, Inc., many Kindergarten pupils demonstrated difficulty in identifying beginning sounds, matching letters to corresponding sounds, and blending sounds to form words. These observed challenges indicated the need for an intervention that is both engaging and effective in strengthening phonemic awareness skills. Hence, this action research aims to enhance the phonemic awareness of Kindergarten pupils using interactive phonics games. Specifically, it seeks to determine the effectiveness of these games in improving learners' phonemic awareness skills and to describe their engagement during the intervention. The findings of this study may provide valuable insights for teachers, school administrators, and curriculum developers in designing developmentally appropriate instructional strategies that support early literacy development.

Statement of the Problem - This action research aims to enhance the phonemic awareness of Kindergarten pupils at St. Scholastica's College Tacloban Inc. during the School Year 2025–2026 using interactive phonics games. Specifically, it seeks to answer the following questions:

- What is the pre-intervention level of phonemic awareness among the pupils in terms of Initial sound identification; Letter–sound matching; and Sound blending?
- Is there a significant difference between the pre-test and post-test scores of the pupils after the implementation of interactive phonics games?
- What are the experiences and observations of the teacher-researcher regarding the pupils' engagement and progress during the play-based intervention?

2. Methodology

This study employed an action research design to determine the effectiveness of interactive phonics games in enhancing the phonemic awareness of Kindergarten pupils. Action research is appropriate for this study as it focuses on improving classroom practices and addressing learners' immediate learning needs. The respondents of the study were selected using purposive sampling. Specifically, the participants consisted of Kindergarten pupils from St. Scholastica's College Tacloban Inc. who were identified based on their pre-test scores in phonemic awareness. The pre-test covered three areas: initial sound identification, letter–sound matching, and sound blending, with ten (10) items in each area for a total of thirty (30) items. The pupils' scores were interpreted using the following criteria: 24–30 as High Phonemic Awareness, 16–23 as Developing, and 0–15 as Needs Improvement. Pupils who obtained scores within the Developing and Needs Improvement levels were included as respondents in the study. These learners were intentionally selected as they require instructional support and are the primary beneficiaries of the intervention. This approach ensures that the phonics-based intervention is directed toward learners who need improvement in phonemic awareness skills.

The study utilized three research instruments: a teacher-made phonemic awareness test, an observation checklist, and field notes. The phonemic awareness test was used as both pre-test and post-test to measure pupils' skills in initial sound identification, letter–sound matching, and sound blending. The observation checklist was used to monitor pupils' engagement and participation during the intervention, while field notes were used to document observations and reflections of the teacher-researcher. The intervention consisted of a series of interactive phonics games conducted over five weeks. These activities included Sound Scavenger Hunt, Shoot and Sound Ball, and I Spy Blending, which were designed to target specific phonemic awareness skills. The pre-test was administered before the intervention, and the post-test was conducted after the completion of all activities.

For data analysis, descriptive statistics such as mean and percentage were used to determine the level of phonemic awareness. A paired t-test was utilized to determine whether there was a significant difference between pre-test and post-test scores. Qualitative data gathered from observations and field notes were analyzed thematically to describe pupils' engagement and learning experiences.

Ethical Considerations - Prior to the conduct of the study, formal approval was secured from the Academic Coordinator of St. Scholastica's College Tacloban, Inc. Written informed consent was obtained from the parents or legal guardians of all participating pupils before their inclusion in the study. Participation was voluntary, and parents were informed of the nature, purpose, and procedures of the research. Confidentiality and anonymity were strictly maintained using coded identifiers instead of pupil names in all data recording and analysis. All research activities were developmentally appropriate and designed to support learners' educational growth without causing any form of psychological, emotional, or academic risk.

3. Results and discussion

This section presents the analysis and interpretation of data gathered to determine the effectiveness of interactive phonics games in enhancing the phonemic awareness of Kindergarten pupils. Descriptive statistics such as mean and percentage were used, and a paired t-test was employed to determine the significance of the difference between pre-test and post-test scores. Qualitative data from observations and reflective journals were also analyzed to support the findings.

3.1 Level of Phonemic Awareness Before and After the Intervention

Table 1.1
Summary of Pre-Test and Post-Test Scores

Test	Lowest Score	Highest Score
Pre-Test	17	30
Post-Test	24	30

Table 1.2
Mean Scores of Pupils

Test	Mean	Interpretation
Pre-Test	25.94	High
Post-Test	28.82	High

Table 1 shows that the pupils' pre-test scores ranged from 17 to 30, while post-test scores ranged from 24 to 30, indicating an overall improvement in performance after the intervention. As shown in Table 2, the pre-test mean score of 25.94 is interpreted as High, indicating that pupils already had a foundational level of phonemic awareness prior to the intervention. However, after the implementation of interactive phonics games, the mean score increased to 28.82, which is also within the High level but significantly higher than the pre-test mean. This improvement suggests that the intervention enhanced pupils' phonemic awareness skills, particularly in more complex areas such as sound blending, where several pupils initially had low scores.

3.2 Significant Difference Between Pre-Test and Post-Test Scores

Table 2
Paired t-test Result

Computed t-value	Critical t-value	Decision	Interpretation
4.87	2.120	Reject Ho	Significant

Table 3 presents the result of the paired t-test used to determine whether there is a significant difference between the pre-test and post-test scores. The computed t-value of 4.87 is greater than the critical t-value of 2.120 at the 0.05 level of significance. This result leads to the rejection of the null hypothesis. This indicates that there is a significant difference between the pre-test and post-test scores of the pupils. Therefore, the improvement in phonemic awareness is not due to chance but is attributed to the use of interactive phonics games.

3.3 Pupils' Engagement and Participation During the Intervention

Table 3

Mean Scores per Indicator (Observation Checklist)

Indicator	Mean	Interpretation
Identifies initial sounds	2.76	Always Observed
Matches letter-sound	2.71	Always Observed
Blends sounds	2.35	Sometimes Observed
Recognizes sound relationships	2.35	Sometimes Observed
Participates actively	3.00	Always Observed
Shows interest	3.00	Always Observed
Follows instructions	3.00	Always Observed
Responds to prompts	3.00	Always Observed

Table 4

Overall Mean of Observation Checklist

Overall Mean	Interpretation
2.79	Always Observed

The observation checklist results revealed that pupils' phonemic awareness skills and participation during the intervention were generally "Always Observed," with an overall mean score of 2.79. The highest mean scores (3.00) were observed in pupils' participation, interest, and responsiveness, indicating that the interactive phonics games created a highly engaging learning environment. However, slightly lower mean scores were recorded in sound blending and sound recognition (2.35), suggesting that these skills were more challenging for some pupils. Despite this, the results still indicate progress and improvement. These findings imply that interactive phonics games not only improve academic performance but also enhance pupils' engagement and motivation, which are essential in early childhood learning.

3.4 Pupils' Learning Experiences During the Intervention

Results (Reflective Journal Summary). The reflective journal entries revealed that pupils were enthusiastic, active, and highly engaged during the phonics activities. Most pupils were able to correctly identify sounds and participate in the games. However, some pupils had trouble in distinguishing certain sounds and required teacher support. Strategies such as modeling, prompting, and the use of visual aids were found to be effective in addressing these challenges. The qualitative findings support the quantitative results by showing that pupils learned effectively through interactive and play-based activities. The use of phonics games provided a meaningful and enjoyable learning experience. The need for teacher guidance highlights the importance of scaffolding in early literacy instruction. Despite some challenges, pupils demonstrated improvement and increased confidence in performing phonemic tasks.

The findings of the study consistently demonstrate that interactive phonics games are effective in enhancing phonemic awareness among Kindergarten pupils.

- The increase in mean scores indicates improvement in performance
- The significant t-test result confirms the effectiveness of the intervention
- The observation checklist shows high levels of engagement
- The reflective journal provides evidence of positive learning experiences

These results suggest that integrating interactive phonics games in classroom instruction is an effective strategy for improving early literacy skills.

This study aimed to determine the effectiveness of interactive phonics games in enhancing the phonemic awareness of Kindergarten pupils at St. Scholastica's College Tacloban, Inc. Specifically, it sought to assess the pupils' phonemic awareness before and after the intervention, determine whether there was a significant difference

between pre-test and post-test scores, and describe pupils' engagement and learning experiences during the intervention. The findings of the study revealed the following:

- The pupils obtained a mean score of 25.94 in the pre-test and 28.82 in the post-test, both interpreted as High, indicating an improvement in phonemic awareness after the intervention.
- The computed t-value of 4.87 was greater than the critical t-value of 2.120, indicating a significant difference between the pre-test and post-test scores.
- The observation checklist yielded an overall mean of 2.79, interpreted as "Always Observed," showing that pupils were highly engaged and actively participated during the phonics activities.
- Reflective journal entries revealed that pupils were enthusiastic and motivated during the intervention, although some had trouble in more complex skills such as sound blending, which required teacher support.

Practical Educational Implications

- The findings of this study offer important implications for educational practice, particularly in early childhood literacy instruction.
- For teachers, the results suggest that integrating interactive phonics games into classroom instruction can effectively strengthen phonemic awareness while increasing learner engagement and participation.
- For learners, play-based phonics activities provide enjoyable and meaningful learning experiences that support confidence-building and active literacy development.
- For schools, the findings support the implementation of structured phonics intervention programs and professional development initiatives focused on interactive literacy instruction.
- For curriculum developers, this study highlights the value of incorporating contextualized, game-based literacy activities into Kindergarten instructional frameworks.
- These implications affirm that interactive phonics instruction is not only effective in improving literacy outcomes but also practical for classroom implementation.

4. Conclusion

The findings of this study demonstrate that interactive phonics games significantly enhanced the phonemic awareness of Kindergarten pupils. The statistically significant improvement in post-test scores confirms the effectiveness of structured play-based phonics intervention in strengthening foundational literacy skills. Beyond measurable academic gains, the intervention fostered high levels of learner engagement, participation, and motivation. This indicates that interactive approaches create supportive learning environments that encourage active literacy development. The study contributes to the growing body of Philippine-based classroom action research by providing evidence that structured, context-sensitive phonics interventions can address early literacy challenges effectively.

Recommendations - Based on the findings and conclusions of the study, the following recommendations are proposed:

- *For Teachers* - Teachers are encouraged to incorporate interactive phonics games into their daily instruction to enhance pupils' phonemic awareness and engagement in learning.
- *For School Administrators* - School administrators may support the implementation of play-based and interactive learning strategies by providing training, materials, and resources for teachers.

- *For Curriculum Developers* - Curriculum planners may consider integrating more game-based phonics activities into early childhood programs to strengthen foundational literacy skills.
- *For Parents/Guardians* - Parents may reinforce phonemic awareness skills at home by engaging children in simple sound-based activities and games.
- *For Future Researchers* - Future studies may explore the effectiveness of interactive phonics games in different grade levels or investigate other strategies that support phonemic awareness and early literacy development.

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Breaking barriers to inclusion: A study on the need for an inclusive learning resource center in Palayan City

De Guzman, Donna D. ✉

Nueva Ecija University of Science and Technology, Philippines (donnaddeguzman@gmail.com)

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Abstract

This study assessed the necessity of establishing an Inclusive Learning Resource Center (ILRC) in Palayan City, Nueva Ecija, in accordance with Republic Act No. 11650 and the Sustainable Development Goals (SDGs) advocating inclusive education. Using a descriptive-evaluative quantitative design, 116 respondents—including parents, teachers, and LGU social workers—participated in the study via structured questionnaires. The research examined perceptions of access to education, support services, resource allocation, and community inclusion. Results revealed substantial gaps in infrastructure, therapy services, trained personnel, and inclusive community programs. Parents expressed dissatisfaction with current support services ($M = 2.13$), teachers acknowledged the need for more resources and training ($M = 3.08$), and social workers reported limited community inclusion initiatives ($M = 1.94$). Across all groups, the leading challenge was lack of funding, followed by accessibility and inadequate training. These findings affirm the urgent need for an ILRC to centralize services, support professional development, and promote disability-inclusive programs in Palayan City.

Keywords: inclusive education, needs assessment, learning resource center, community inclusion

Breaking barriers to inclusion: A study on the need for an inclusive learning resource center in Palayan City

1. Introduction

Inclusive education is a fundamental right supported by both national and international mandates. Under Republic Act No. 11650, local government units in the Philippines are required to establish Inclusive Learning Resource Centers (ILRCs) to provide free, accessible support services for learners with disabilities. These centers are intended to reduce barriers to education by offering programs tailored to the unique needs of marginalized learners, in line with Sustainable Development Goals (SDGs) that promote equitable and quality education for all.

Despite this legal framework, millions of children—particularly those with disabilities, from rural areas, or disadvantaged backgrounds—remain excluded from education due to poverty, inaccessible infrastructure, lack of trained teachers, and weak program implementation (UNESCO, 2020; UNICEF, 2024). Studies have shown that while numerous laws exist to support persons with disabilities, actual delivery of services remains limited. Existing educational systems often fail to address the needs of students with intellectual or developmental disabilities, and many localities lack inclusive learning environments and essential support technologies.

In response to these ongoing challenges, this study seeks to assess the readiness and specific requirements for establishing an Inclusive Learning Resource Center in Palayan City. It aims to identify existing gaps in resources, infrastructure, and support services, as well as the perspectives of key stakeholders. With this, the following Statement of the Problem is formulated to guide the investigation.

Statement of the Problem - This study aims to assess the needs for establishing an Inclusive Learning Resource Center (ILRC) in the Local Government Unit (LGU) of Palayan City. Specifically, it seeks to answer the following questions:

- How may the profile of the respondents be described in terms of parents – sex, age, civil status, monthly income, and occupation; teachers – sex, age, civil status, monthly income, and occupation; and LGU social workers – sex, age, civil status, monthly income, and occupation?
- How may the needs of the Local Government Unit of Palayan City be described in terms of education and programs for the community?
- How may the need for an Inclusive Learning Resource Center (ILRC) be described in terms of access to education, support services, community inclusion, and resource allocation?
- What are the challenges toward establishing an Inclusive Learning Resource Center (ILRC)?

2. Methodology

Research Design - This study employed a quantitative research method, specifically a descriptive-evaluative research design, to determine the needs assessment for establishing an Inclusive Learning Resource Center (ILRC) in the Local Government Unit (LGU) of Palayan City. The descriptive-evaluative design systematically gathers and analyzes measurable data to describe existing conditions and assess the LGU's readiness for inclusive education. As defined by Creswell and Creswell (2018), descriptive research focuses on identifying and describing the characteristics of a group or phenomenon. It answers questions related to “Who, What, When, Where, Why, and How” through data collection methods such as surveys, interviews, and observations. In this study, the researchers utilized survey questionnaires to collect numerical data from targeted respondents, enabling a comprehensive understanding of the current educational needs in the community. The chosen quantitative

approach provided a structured method to evaluate the community's readiness and resources. The data collected were presented using descriptive statistical tools such as frequency, percentage, and weighted mean for interpretation and analysis.

Research Locale - The study was conducted in selected barangays of Palayan City, particularly those near the Municipal Hall—Barangay Singalat, Barangay Atate, and Barangay Caimito. Additionally, two elementary schools with Special Education (SPED) programs were involved: Palayan City Central School and Fort Magsaysay Elementary School. Barangay Atate, the nearest to the Municipal Hall and the most populous according to the 2020 census, and Barangay Caimito, a BECA awardee with 2,553 residents, were among the focal areas. The Municipal Hall is situated in Barangay Singalat. The chosen schools are the only institutions in the city offering SPED, making them significant locations for gathering relevant data.

Respondents of the Study - The study involved three groups of respondents: Parents/Guardians of students currently enrolled in Palayan City schools; Teachers, particularly those with SPED or inclusive education experience; and LGU Social Workers who provide services to families with children with disabilities.

Sampling Procedure - The sampling technique that researchers used is Stratified Sampling, this study has a total number of 116 respondents. According to Dr. Bisht R. (2024), stratified sampling is a sampling method used to divide a bigger population into subgroups or strata, which can then be further used to draw samples using a random sampling method. In doing so, the researchers have the following criteria: (1) Parents - must be a parent or guardian currently enrolled in a school in Palayan City.; (2) SPED/Elementary Teachers - must have experience working with students with disabilities or have undergone training in inclusive education.; and (3) LGU Social Workers - must have experience in providing support to families of children with disabilities is preferred.

Table 1

Distribution of Respondents

Barangay	Parent/Guardian- respondents		LGU social worker-respondents	
	Population	Sample	Population	Sample
Singalat	134	20	7	6
Atate	134	20	7	6
Caimito	134	20	7	4
Total	402	60	21	16

Table 2

Distribution of Population per School

Elementary School	Teacher-respondents	
	Population	Sample
Palayan City Elementary School	30	20
Fort Magsaysay Elementary School	30	20
Total	60	40

Research Instrument - The main research instrument was a survey questionnaire, validated by experts in the field of special needs education. It was developed based on the CIPP Model (Context, Input, Process, and Product), ensuring that the needs of the community, available resources, and expected outcomes of the ILRC were addressed. The questionnaire was composed of 49 items, divided into four parts: demographic profile of respondents, needs of the LGU of Palayan City, need for an inclusive learning resource center, and challenges toward establishing an ILRC. To ensure reliability, the instrument was pilot-tested with selected respondents from Palayan City's LGU. Feedback and statistical tools were used to refine the instrument before full deployment.

Data Gathering Procedure - Following the approval of the research title, the researchers sought assistance and permission from the Office of the Mayor of Palayan City. Upon securing approval, they personally administered the questionnaires to the selected respondents—parents, teachers, and LGU social workers. The researchers visited the barangays near the Municipal Hall and explained the objectives and significance of the study to the participants. Clear instructions were provided to ensure accurate completion of the questionnaire, and participants were assured of the confidentiality of their responses.

Data Analysis Techniques - To analyze the gathered data, the following statistical tools were used:

- **Frequency and Percentage:** Used for describing the demographic profiles and challenges (SOP 1 and 4). Frequency refers to the number of times a response appears, while percentage converts this into a proportional representation out of 100 (Serway & Jewett, 2018; Bluman, 2018).
- **Weighted Mean:** Applied to analyze the perceived needs of the LGU and the ILRC (SOP 2 and 3). According to Wais (n.d.), the weighted mean gives more importance to data with higher relevance by multiplying values with corresponding weights before averaging.

The interpretation of the results was guided by Likert scales, as presented below:

Table 3

Likert Scale for LGU Needs

Scale	Mean Range	Description	Interpretation
4	3.25 – 4.00	Strongly Agree	LGU effectively meets the community's needs (e.g., education, health, programs).
3	2.50 – 3.24	Agree	Moderate satisfaction; improvements may still be required.
2	1.75 – 2.49	Disagree	Noticeable gaps in community services; actions needed.
1	1.00 – 1.74	Strongly Disagree	Significant shortcomings; urgent intervention needed.

Table 4

Likert Scale for ILRC Needs

Scale	Mean Range	Description	Interpretation
4	3.25 – 4.00	Strongly Agree	High need for ILRC to address access, inclusion, and resources.
3	2.50 – 3.24	Agree	Recognizes ILRC importance but suggests current efforts may be partially sufficient.
2	1.75 – 2.49	Disagree	Doubts about urgency or satisfaction with current alternatives.
1	1.00 – 1.74	Strongly Disagree	ILRC considered unnecessary in the current context.

3. Results

Table 5

Profile of Parents

Age	Frequency (f)	Percentage (%)
20 years old and below	0	0
21-30 years old	14	23.33
31-40 years old	18	30
41-50 years old	12	20
51-60 years old	16	26.67
61 years old and above	0	0
Total	60	100
Civil Status		
Single	16	26.67
Married	42	70
Widowed	2	3.33
Separated	0	0
Total	60	100
Civil Status		
Php 10,000 and below	40	66.67
Php 10,001 - 20,000	13	21.67
Php 20,001 - 30,000	7	11.67
Php 30,001 - 40,000	0	0
Php 40,001 - 50,000	0	0
Php 50,001 - and above	0	0
Total	60	100

Table 5 ... continued

Occupation	Frequency (f)	Percentage (%)
Self-Employed	16	26.67
Private Employee	10	16.67
Government Employee	6	10.00
Business Owner	5	8.33
Unemployed	23	38.33
<i>Total</i>	60	100

The demographic profile of parent respondents reflects a community that is predominantly composed of mature adults, with 30% aged 31–40 and 26.67% aged 51–60. These age groups typically exhibit increased awareness of their children's developmental and educational needs, which positions them as important stakeholders in supporting inclusive education. The majority (70%) are married, which, according to UNICEF (2024), often translates to a more stable and involved family structure—an important factor for sustaining a child's participation in inclusive programs. However, socioeconomic conditions are a major concern. A significant 66.67% of parents reported earning ₱10,000 or less per month, and 38.33% are unemployed. This financial hardship likely limits their ability to access specialized educational services such as private therapy, assistive technologies, or even transportation to distant SPED centers. UNESCO (2023) emphasizes that financial insecurity remains one of the primary barriers to equitable access to education for children with disabilities, especially in low-income and rural communities. The occupational data reinforces this issue, revealing that only 10% are government employees and 16.67% are private employees, further confirming the limited economic resources available. These findings strongly suggest the urgent need for the establishment of a local, government-supported Inclusive Learning Resource Center (ILRC) in Palayan City to ensure that children with special needs receive appropriate, accessible, and affordable support services.

Table 6*Profile of Teachers*

Gender	Frequency (f)	Percentage (%)
Male	6	15
Female	34	85
<i>Total</i>	40	100
<i>Age</i>		
20 years old and below	0	0
21-30 years old	9	22
31-40 years old	14	30
41-50 years old	8	20
51-60 years old	9	27.5
61 years old and above	0	0
<i>Total</i>	40	100
<i>Civil Status</i>		
Single	11	27.50
Married	27	70
Widowed	2	2.50
Separated	0	0
<i>Total</i>	40	100
<i>Monthly Income</i>		
Php 10,000 and below	1	2.50
Php 10,001 - 20,000	6	15
Php 20,001 - 30,000	3	7.50
Php 30,001 - 40,000	20	50
Php 40,001 - 50,000	10	25
Php 50,001 - and above	0	0
<i>Total</i>	40	100
<i>Occupation</i>		
SPED Teacher	4	10
General Teacher	34	85
Others	2	5
<i>Total</i>	40	100

Teacher respondents are overwhelmingly female (85%), with most falling into the age groups of 31–40 (30%) and 51–60 (27.5%). These demographics suggest a workforce with a balanced mix of both energetic mid-career educators and more experienced mentors who could potentially contribute to the implementation of inclusive education strategies. A large percentage (70%) are married, implying that their lived experiences may be closely aligned with those of the parents in the community, potentially fostering shared advocacy for inclusive practices. Economically, teachers fare better than parents: 50% earn between ₱30,001–₱40,000, and 25% earn ₱40,001–₱50,000. However, despite the relative financial security, the data reveals a critical shortage in specialization—only 10% are Special Education (SPED) teachers. This lack of trained SPED professionals is a well-documented barrier to inclusive education. As noted by the Department of Education (DepEd, 2022), the shortage of trained teachers in special and inclusive education remains a national challenge, particularly outside urban centers. UNESCO (2021) further highlights that training and professional development are key components in ensuring the success of inclusive education policies. Therefore, the data justifies the need to establish an ILRC in Palayan City—not only to provide services to learners but also to support the professional development of teachers in inclusive education.

Table 6
Profile of LGU Social Workers

Gender	Frequency (f)	Percentage (%)
Male	4	25
Female	12	75
<i>Total</i>	16	100
<i>Age</i>		
20 years old and below	0	0
21-30 years old	2	12.50
31-40 years old	3	18.75
41-50 years old	7	43.75
51-60 years old	1	6.25
61 years old and above	3	18.75
<i>Total</i>	16	100
<i>Monthly Income</i>		
Php 10,000 and below	14	87.50
Php 10,001 - 20,000	2	12.50
Php 20,001 - 30,000	0	0
Php 30,001 - 40,000	0	0
Php 40,001 - 50,000	0	0
Php 50,001 - and above	0	0
<i>Total</i>	16	100
<i>Occupation</i>		
Barangay Welfare Officer	0	0
Barangay Social Worker	9	56.25
Others	7	43.75
<i>Total</i>	16	100

The LGU social workers in the study are mostly female (75%) and largely fall within the 41–50 age range (43.75%), suggesting a relatively experienced group of professionals. Age and gender distributions are consistent with national trends in the social work field, where women often dominate caregiving and social support roles (DSWD, 2023). Despite their experience, however, the clear majority (87.5%) earn ₱10,000 or less monthly, reflecting economic constraints like those of the parent respondents. This financial limitation could impact their ability to consistently deliver outreach services or advocate for more comprehensive inclusion programs, especially in remote barangays. Most social workers identified themselves as barangay social workers (56.25%), which implies close interaction with families and a deep understanding of community-level issues. However, the capacity of LGU social workers to implement inclusive education programs effectively is often constrained by lack of training and institutional support. According to UNICEF Philippines (2023), local service providers often work under high caseloads with minimal resources, impeding the effectiveness of well-intentioned national mandates. Therefore, establishing an ILRC in Palayan City could serve as a centralized support hub not only for learners and families but also for front-line professionals like social workers, helping bridge service delivery gaps and strengthening the overall social support system.

Table 7*Educational Needs of the LGU of Palayan City According to Parents*

	Statements	Mean	Verbal interpretation
1	There are well-trained teachers who support the needs of learners with disabilities.	2.33	Disagree
2	There are special programs to help learners with disabilities.	2.93	Agree
3	There are enough schools in Palayan City that accommodate learners with disabilities.	1.55	Strongly Disagree
4	Learners have access to enough learning materials like books, visual aids, and audio supports.	2.23	Disagree
5	Schools provide extra support, like mentoring or tutoring, for learners with disabilities.	1.85	Disagree
6	There are school facilities like clinics and emergency services to ensure the safety of learners with disabilities.	1.95	Disagree
7	The local government provides scholarships for learners with disabilities.	2.6	Agree
	General Mean	2.21	Disagree

The results reveal a clear perception among parents that the Local Government Unit (LGU) of Palayan City is not adequately meeting the educational needs of learners with disabilities, as reflected in the general mean of 2.21, which corresponds to the interpretation “Disagree.” This indicates that parents perceive significant gaps in teacher training, facilities, learning resources, and support services. Notably, the lowest-rated item was the availability of schools that can accommodate learners with disabilities, receiving a mean score of 1.55 (Strongly Disagree). This highlights a critical shortage of inclusive schools in the city—a concern that severely limits access to equitable education. According to UNESCO (2023) and UNICEF Philippines (2024), lack of accessible infrastructure and trained personnel remains one of the greatest barriers to implementing inclusive education at the local level. These findings strongly support the urgent need for an Inclusive Learning Resource Center (ILRC) in Palayan City to centralize services, enhance teacher support, and ensure that all learners—regardless of disability—have access to quality and inclusive education.

Table 8*Needs in Programs for Community of LGU of Palayan City in Establishing an Inclusive Learning Resource Center According to LGU Social Worker*

	Statements	Mean	Verbal Interpretation
1	The LGU collaborates with NGOs on teacher training, inclusive education, and school infrastructure.	2.43	Disagree
2	Community stakeholders, including social workers, are involved in educational planning.	2.62	Agree
3	Community-based rehabilitation programs, such as therapy and social services, are available for learners with disabilities.	1.43	Strongly Disagree
4	The LGU offers scholarships, financial aid, and disability awareness campaigns.	2.56	Agree
5	Community centers have SPED centers, resource centers, and libraries provide inclusive learning opportunities.	1.5	Strongly Disagree
6	The LGU conducts awareness campaigns on inclusive education.	1.18	Strongly Disagree
7	There are public consultations regarding educational programs.	1.87	Disagree
	General Mean	1.94	Disagree

The findings indicate that LGU social workers perceive the Local Government of Palayan City as lacking in community-level programs and support systems for learners with disabilities, as shown by the general mean of 1.94, which falls under “Disagree.” The most critical gap identified is the lack of awareness campaigns on inclusive education, which received the lowest mean score of 1.18 (Strongly Disagree). This suggests that efforts to educate and mobilize the public regarding inclusive practices are either minimal or non-existent. According to UNICEF Philippines (2024) and UNESCO (2023), public awareness is a vital component in transforming attitudes and encouraging inclusive policy implementation at the local level. The lack of such initiatives implies a weak foundation for inclusive education in the community, reinforcing the need for an Inclusive Learning Resource Center (ILRC) that could serve as both a service provider and an advocacy hub for disability-inclusive development.

Table 9
Teachers' Perspectives on the Need for an Inclusive Learning Center

	Statements	Mean	Verbal interpretation
1	An Inclusive Learning Resource Center is essential to support teachers in delivering quality education for all learners.	3.65	Strongly Agree
2	The LGU prioritizes inclusive learning programs, including SPED support and teacher training.	2.42	Disagree
3	Some learners cannot attend classes due to insufficient facilities and resources.	2.82	Agree
4	Special education classes are accessible, but teachers need more resources and training.	3.55	Strongly Agree
5	Alternative learning methods (e.g., UDL, assistive technology) are being introduced, but teachers need more training and resources.	3.40	Strongly Agree
6	Teachers must adapt their strategies to integrate assistive technologies in learning centers.	2.38	Disagree
7	Current educational facilities are not sufficient to meet the diverse learning needs of all students.	3.32	Strongly Agree
	General Mean	3.08	Agree

The perspectives of teachers reveal a generally favorable view toward the establishment of an Inclusive Learning Resource Center (ILRC) in Palayan City, as indicated by the general mean of 3.08, which corresponds to “Agree.” Among all the items, the strongest consensus was observed in the statement, “*An Inclusive Learning Resource Center is essential to support teachers in delivering quality education for all learners*,” which received a mean of 3.65 (Strongly Agree). This highlights that educators recognize the critical role an ILRC would play not only in enhancing learner access but also in equipping them with the necessary tools, training, and resources to address diverse educational needs. However, their responses also reflect gaps in current systems—particularly a lack of training and resource support in integrating inclusive strategies and assistive technologies. These concerns are consistent with findings from UNESCO (2023) and the Department of Education (2022), which emphasize that the success of inclusive education is closely tied to institutional support, professional development, and the availability of learning tools. Therefore, the teachers' perspectives strongly affirm the urgent need for an ILRC that can function as both a training hub and a resource center to improve inclusive educational delivery in Palayan City.

Table 10
Need for an Inclusive Learning Resource Center in terms of Support Services According to Parents

	Statements	Mean	Verbal interpretation
1	The multidisciplinary team effectively supports teachers in implementing inclusive education.	2.56	Agree
2	Parents receive ongoing training in inclusive education to effectively support their children with disabilities.	2.21	Disagree
3	Therapy services, such as speech, language, and behavioral therapy, are available in the ILRC to support parents in meeting their children's needs.	1.63	Strongly Disagree
4	Psychological counseling services are sufficient in helping parents manage their children's well-being in the classroom.	1.96	Disagree
5	Health services, including mental health counseling and school nursing, are included in the ILRC to assist parents with their children's health needs.	1.91	Disagree
6	The LGU allocates sufficient funds for learning materials to support special education instruction.	2.5	Disagree
7	Peer support programs like mentoring, buddy systems, and tutoring help create an inclusive learning environment.	2.16	Disagree
	General Mean	2.13	Disagree

Parents' perspectives underscore a clear concern regarding the lack of adequate support services for learners with disabilities in Palayan City, as reflected by the general mean of 2.13, which falls under the interpretation “Disagree.” The most critical gap identified is the absence of therapy services—including speech, language, and behavioral interventions—within the community, as shown by the lowest mean of 1.63 (Strongly Disagree). This result signals that families are not receiving the professional support needed to address developmental and behavioral challenges faced by their children. According to UNICEF Philippines (2024) and UNESCO (2023), access to multidisciplinary services such as therapy, psychological counseling, and health interventions is essential in building an inclusive education system that supports both learners and their families. The overall findings

indicate that while there is modest recognition of multidisciplinary team support, most parents feel they lack the training, health services, and structured peer support programs necessary to meaningfully engage in their child's education. These gaps reinforce the urgent need for an Inclusive Learning Resource Center (ILRC) that can provide centralized, coordinated, and accessible support services to bridge existing deficiencies and promote equitable learning opportunities for all children.

Table 11

Need for an Inclusive Learning Resource Center in terms of Support Services According to Teachers

Statements	Mean	Verbal interpretation
1 The multidisciplinary team effectively supports teachers in implementing inclusive education.	3.35	Strongly Agree
2 Parents receive ongoing training in inclusive education to effectively support their children with disabilities.	3.25	Agree
3 Therapy services, such as speech, language, and behavioral therapy, are available in the ILRC to support parents in meeting their children's needs.	2.00	Disagree
4 Psychological counseling services are sufficient in helping parents manage their children's well-being in the classroom.	2.30	Disagree
5 Health services, including mental health counseling and school nursing, are included in the ILRC to assist parents with their children's health needs.	2.12	Disagree
6 The LGU allocates sufficient funds for learning materials to support special education instruction.	2.35	Disagree
7 Peer support programs like mentoring, buddy systems, and tutoring help create an inclusive learning environment.	3.10	Agree
General Mean	2.64	Agree

The results indicate that teachers generally agree on the need for an Inclusive Learning Resource Center (ILRC) in Palayan City, with a general mean of 2.64, suggesting a moderate recognition of its importance in terms of support services. The highest-rated item was the presence of multidisciplinary teams effectively supporting inclusive education ($M = 3.35$, Strongly Agree), highlighting teachers' confidence in collaborative approaches. However, there are notable deficiencies in key support services, such as therapy ($M = 2.00$), psychological counseling ($M = 2.30$), and health services ($M = 2.12$), all of which received Disagree ratings. These results underscore the urgent need for comprehensive support infrastructure in the ILRC. This aligns with recent literature, including UNESCO (2020) and Nguyen and Mitchell (2022), which emphasize that without adequate support services and resource allocation, inclusive education efforts risk being ineffective and unsustainable.

Table 12

Need for an Inclusive Learning Resource Center in terms of Community Inclusion According to Parents

Statements	Mean	Verbal interpretation
1 The community ensures equal learning opportunities for students with disabilities through inclusion, accessible materials, and non-discrimination.	2.18	Disagree
2 The local government unit actively promotes awareness of inclusive education for students with special needs.	2.56	Agree
3 Public places like transportation, libraries, and sidewalks are safe and accessible for learners with disabilities.	2.16	Disagree
4 Parents are involved in planning and decision-making for their children's education.	2.50	Disagree
5 Community programs like workshops and support groups are available to help support learners with disabilities.	2.50	Disagree
6 Schools organize activities like diversity celebrations, talent shows, and inclusive sports events to support learners with disabilities.	2.46	Disagree
7 The local government promotes acceptance and prevents discrimination by implementing inclusive education policies, programs, and raising awareness.	2.41	Disagree
General Mean	2.40	Disagree

The results reveal that parents generally disagree on the adequacy of community inclusion efforts for learners with disabilities, as indicated by a general mean of 2.40. While there is moderate agreement that the local government unit promotes awareness of inclusive education ($M = 2.56$), most aspects—such as access to public spaces ($M = 2.16$), parental involvement in educational decision-making ($M = 2.50$), and the availability of inclusive community programs ($M = 2.50$)—fall below satisfactory levels. These findings suggest that despite some efforts, significant gaps remain in building an inclusive community. This supports the observations of

Ainscow (2021) and United Nations reports (2020), which emphasize that inclusive education requires not only school-based interventions but also strong community participation and accessible environments to foster meaningful inclusion.

Table 13

Need for an Inclusive Learning Resource Center in terms of Resource Allocation According to Teachers

	Statements	Mean	Verbal interpretation
1	Insufficient funding for inclusive education limits teachers' access to training, teaching materials, and classroom resources.	3.30	Strongly Agree
2	Ongoing government support is crucial for funding ILRC and specialized teacher training.	3.25	Agree
3	The LGU allocates a budget for SPED programs, but teachers still need more support in implementing inclusive teaching strategies.	3.22	Agree
4	Resource centers help teachers deliver specialized learning for students with disabilities.	3.40	Strongly Agree
5	Additional materials and equipment, like braille and hearing aids, help teachers better support learners with disabilities.	3.52	Strongly Agree
6	Schools provide teachers with assistive learning devices to improve instruction, communication, and engagement.	3.35	Strongly Agree
7	The LGU improves financial planning for special education by allocating funds for teacher training and classroom support.	2.30	Disagree
General Mean		3.19	Agree

The findings indicate that teachers generally agree on the need for an Inclusive Learning Resource Center (ILRC) in terms of resource allocation, as shown by a general mean of 3.19. Notably, teachers strongly agree that access to additional materials like braille and hearing aids ($M = 3.52$) and resource centers ($M = 3.40$) significantly support inclusive teaching. They also emphasize that schools provide useful assistive devices ($M = 3.35$) and that insufficient funding limits access to training and resources ($M = 3.30$). However, there is disagreement regarding the sufficiency of LGU's current financial planning for special education ($M = 2.30$), indicating a need for more strategic budget allocation. These findings align with Florian and Black-Hawkins (2020), who highlight that effective inclusion depends heavily on access to well-funded, specialized resources and continuous teacher support.

Table 14

Challenges in Establishing an Inclusive Learning Resource Center According to Parents

Challenges in Establishing an ILRC	Frequency (f)	Percentage (%)
Lack of funding	57	20.21
Limited accessibility for students with disabilities	48	17.02
Inadequate teacher training	40	14.18
Weak government support	39	13.82
Insufficient infrastructure	39	13.82
Social Stigma and discrimination	31	10.99
Poor collaboration among stakeholders	28	9.92
<i>Total</i>	282	100

The data reveal that lack of funding is the most frequently identified challenge by parents in establishing an Inclusive Learning Resource Center (ILRC), accounting for 20.21% of responses. This is followed by limited accessibility for students with disabilities (17.02%), inadequate teacher training (14.18%), and weak government support and insufficient infrastructure, both at 13.82%. Social stigma and discrimination (10.99%) and poor collaboration among stakeholders (9.92%) were also cited as barriers. These results emphasize that both financial constraints and systemic issues, such as training gaps and infrastructure inadequacies, are significant concerns. According to Sharma et al. (2020), sustainable inclusive education systems must address these multidimensional barriers through collaborative governance, adequate resource allocation, and inclusive policy implementation to effectively meet the diverse needs of learners with disabilities.

Table 15
Challenges in Establishing an Inclusive Learning Resource Center According to Teachers

Challenges in Establishing an ILRC	Frequency (f)	Percentage (%)
Lack of funding	38	18.62%
Limited accessibility for students with disabilities	36	17.64
Inadequate teacher training	31	15.19
Weak government support	30	14.70
Insufficient infrastructure	24	11.76
Social Stigma and discrimination	23	11.27
Poor collaboration among stakeholders	22	10.78
<i>Total</i>	204	100

The data show that teachers identify lack of funding (18.62%) as the primary challenge in establishing an Inclusive Learning Resource Center (ILRC), followed closely by limited accessibility for students with disabilities (17.64%) and inadequate teacher training (15.19%). Other significant concerns include weak government support (14.70%), insufficient infrastructure (11.76%), and issues related to social stigma and poor collaboration among stakeholders, which account for 11.27% and 10.78%, respectively. These findings highlight the need for a systemic and well-supported approach to inclusive education. As noted by Florian and Black-Hawkins (2021), sustainable inclusion requires not only adequate funding and teacher preparation but also coordinated efforts across government, schools, and communities to remove physical, attitudinal, and institutional barriers to learning.

Table 16
Challenges in Establishing an Inclusive Learning Resource Center According to LGU Social Workers

Challenges in Establishing an ILRC	Frequency (f)	Percentage (%)
Lack of funding	15	18.75
Limited accessibility for students with disabilities	14	17.5
Inadequate teacher training	13	16.25
Weak government support	11	13.75
Insufficient infrastructure	11	13.75
Social Stigma and discrimination	8	10
Poor collaboration among stakeholders	8	10
<i>Total</i>	80	100

The data reveal that LGU social workers perceive the lack of funding (18.75%) as the most pressing challenge in establishing an Inclusive Learning Resource Center (ILRC), followed by limited accessibility for students with disabilities (17.5%) and inadequate teacher training (16.25%). Notably, weak government support and insufficient infrastructure are equally concerning at 13.75% each, while social stigma and poor collaboration among stakeholders each account for 10%. These findings emphasize that while funding is a critical barrier, effective implementation also hinges on training, inter-agency collaboration, and inclusive policy frameworks. According to Sharma et al. (2022), a multi-sectoral and well-resourced approach is essential to overcoming these systemic challenges and ensuring the success of inclusive educational programs.

4. Summary of Findings

The findings reveal that all respondent groups recognize major deficiencies in inclusive education services in Palayan City. Most parents, many of whom are from low-income backgrounds, expressed dissatisfaction with the current state of educational access and support for their children with disabilities. The general mean rating from parents regarding support services was 2.13 (“Disagree”), pointing to an alarming lack of therapy services, psychological counseling, and health provisions. Teachers, while more moderate in their evaluation, indicated a strong need for an ILRC to assist with training, access to resources, and inclusive strategies. Their overall perception was affirmative, with a general mean of 3.08 (“Agree”). LGU social workers, on the other hand, highlighted poor community-level implementation, scoring a general mean of 1.94, which reflects strong dissatisfaction with the lack of awareness campaigns and inclusive facilities. Across all sectors, the most frequently cited challenges were lack of funding, limited accessibility for students with disabilities, inadequate teacher training, weak government support, and insufficient infrastructure. These results consistently point to the urgent necessity of establishing a centralized, well-resourced ILRC to bridge educational gaps and institutional

weaknesses in delivering inclusive education.

Conclusion - The findings of this study make it evident that the Local Government Unit (LGU) of Palayan City is currently not equipped to meet the diverse educational and developmental needs of learners with disabilities. Despite the existence of national legislation, particularly Republic Act No. 11650, which mandates the establishment of Inclusive Learning Resource Centers (ILRCs), implementation at the local level remains inadequate. The study uncovered significant challenges across several dimensions: lack of funding, poor infrastructure, insufficient therapy and health services, undertrained teachers, and minimal community awareness on inclusive education. These gaps are not isolated concerns but interconnected issues that collectively hinder the city's ability to build an inclusive, equitable learning environment.

Parents, many of whom are economically disadvantaged, voiced strong dissatisfaction with the limited availability of support services—particularly therapy, counseling, and accessible learning facilities. Teachers acknowledged the importance of inclusive education but highlighted their lack of training, resources, and institutional support. LGU social workers, who are central to community outreach and social development, reported minimal collaboration efforts and low prioritization of disability-inclusive programming at the community level. Taken together, the perspectives of all stakeholder groups present a consistent narrative: Palayan City urgently needs an institutional framework that consolidates services and support systems for children with disabilities. The proposed ILRC would serve not only as a center for therapy and education but also as a venue for professional training, parent engagement, resource distribution, and advocacy. More importantly, it would embody the principle of educational equity—ensuring that all learners, regardless of ability or socioeconomic status, have the tools and opportunities to thrive.

The establishment of the ILRC is not merely a policy requirement—it is a moral and social imperative. Without such an initiative, the city risks perpetuating cycles of exclusion, marginalization, and underachievement among a vulnerable segment of its population. Therefore, local leaders, educators, families, and community stakeholders must unite in prioritizing inclusive education as a shared responsibility. By investing in an ILRC, Palayan City could lead by example in building a more just, inclusive, and responsive education system for all.

Recommendations

- *Establish an Inclusive Learning Resource Center (ILRC) in Palayan City* - The ILRC should function as a centralized hub offering therapy services, assistive learning technologies, psychological and health counseling, as well as teacher and parent training. This will provide equitable access to specialized services currently unavailable to most families in the city.
- *Strengthen training and capacity-building for teachers and LGU social workers* - The LGU should partner with DepEd and accredited SPED institutions to provide regular, structured training on inclusive education strategies, such as Universal Design for Learning (UDL), behavioral intervention techniques, and assistive technology use. Strengthening human resources ensures that inclusive policies are translated into effective classroom and community practices.
- *Allocate sufficient budget for inclusive education and ILRC operations* - LGU financial planning must prioritize special education. This includes investments in facilities, learning tools (e.g., braille books, speech devices), staff hiring, and maintenance of the ILRC. Transparent and sustained funding mechanisms will ensure continuity and avoid program disruption.
- *Implement regular community awareness and inclusion campaigns* - To reduce stigma and promote acceptance of learners with disabilities, the LGU should conduct public forums, school-based events, and barangay campaigns. These initiatives should be grounded in inclusive values and target both awareness and behavior change, as recommended by UNICEF (2024).
- *Strengthen stakeholder collaboration through inter-agency committees* - A dedicated Inclusive

Education Task Force composed of school heads, SPED coordinators, parents, LGU officers, and civil society organizations should be institutionalized. This body will coordinate planning, implementation, and monitoring of ILRC programs to ensure they are responsive and community-driven.

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Types of fauna species at Central Bicol State University of Agriculture

Lasalita, Rowena C. ✉

Central Bicol State University of Agriculture, Philippines (rowena.lasalita@cbsua.edu.ph)

Bandol, Arrabila SJ.

Obniala, Ryan M.

Frias, Crispin D.

Barbacena, Ray-Ann B.

Nolasco, Michael N.

Aban, Judith J.



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Abstract

This study provides a comprehensive inventory of faunal species at the Central Bicol State University of Agriculture (CBSUA) Pasacao Campus to establish baseline data for biodiversity conservation and environmental management. Utilizing a descriptive and quantitative research design, the study employed direct field observations, transect walks, opportunistic sampling, and photographic documentation across diverse habitats, including forested areas, grasslands, agricultural zones, and built environments. Collected data were analyzed to classify species by taxonomic group, ecological status (native or introduced), and conservation status according to the IUCN Red List and local biodiversity records. The findings revealed a diverse assemblage of fauna, encompassing insects, amphibians, reptiles, birds, and mammals. Insects emerged as the most abundant group, with most recorded species identified as native and categorized under "Least Concern" status. Variations in species distribution across different habitat types underscore the critical role that natural and semi-natural areas play in sustaining local biodiversity. By highlighting the campus as a vital haven for local fauna, the study emphasizes the necessity of continuous biodiversity monitoring and proactive habitat management. The findings provide significant implications for environmental education, suggesting that campus-based biodiversity assessments can serve as a 'living laboratory' for enhancing student engagement in biology. Ultimately, these results serve as a foundational reference for future ecological research, conservation planning, and environmental education initiatives within the university and the broader community.

Keywords: biodiversity, fauna species, origin of fauna, conservation status, habitat types

Types of fauna species at Central Bicol State University of Agriculture

1. Introduction

The Philippines is globally recognized as one of the world's megadiverse countries, hosting an exceptional variety of flora and fauna despite its relatively small land area (Posa et al., 2008; Mallari et al., 2016). This remarkable biodiversity is largely attributed to the nation's tropical climate, complex geological history, and archipelagic structure, which created unique ecological niches and fostered high levels of endemism (Sodhi et al., 2010; Myers et al., 2000). As a result, the Philippines supports thousands of animal species, many of which are found nowhere else on Earth, underscoring the country's importance as a biodiversity hotspot. Fauna refers to the complete assemblage of animal life occurring within a defined area, including both invertebrates such as insects, mollusks, and crustaceans and vertebrates, such as mammals, birds, reptiles, amphibians, and fishes. The diversity of fauna in an area is shaped by a combination of abiotic factors (e.g., temperature, humidity, topography, and habitat structure) and biotic interactions, including competition, predation, and symbiosis (Moura et al., 2021). Additionally, anthropogenic influences—such as habitat alteration, pollution, and the introduction of invasive species—significantly influence faunal distribution and abundance (Gonzalez et al., 2020).

Faunal communities are integral to ecosystem functioning. Animals serve as pollinators, predators, prey, seed dispersers, decomposers, and ecosystem engineers, performing ecological roles essential to maintaining ecological stability and facilitating natural processes such as nutrient cycling, seed germination, and population control (Donoso et al., 2020). The loss or decline of faunal species can therefore trigger cascading effects that diminish ecosystem productivity and resilience. They also support environmental impact assessments, protected-area planning, and conservation policy development (Marine Faunal Species Inventory for the Indian EEZ: Necessity and Significance, 2022). Stuart L. Pimm et al., 2014, reported that tropical regions remain highly vulnerable to species extinction, stressing that continuous faunal documentation is essential for detecting biodiversity loss and guiding effective conservation strategies.

The Central Bicol State University of Agriculture (CBSUA) Pasacao Campus, located in Sta. Rosa del Norte, Pasacao, Camarines Sur, spans approximately 4.2 hectares. Despite its relatively small area, the campus includes a variety of microhabitats such as landscaped vegetation, open fields, shade trees, and nearby riparian zones that can support a diverse assemblage of fauna. The presence of both cultivated and naturally regenerating plants creates habitat opportunities for insects, birds, reptiles, and small mammals. However, due to increasing human activities such as infrastructure development, landscaping modifications, and agricultural practices, the faunal composition of the campus may be experiencing shifts that remain undocumented.

As a host institution for the Bachelor of Science in Environmental Science (BSES) program, CBSUA Pasacao emphasizes the importance of ecological research and environmental stewardship. Environmental science, as an interdisciplinary field, investigates the natural environment and human impacts through scientific methodologies. Conducting a faunal inventory within the campus aligns with the program's objectives by enabling students to engage in field-based biodiversity research, develop taxonomic skills, and contribute to local conservation initiatives.

Despite the ecological significance of faunal diversity in academic landscapes, there remains limited scientific documentation specifically concerning the fauna of CBSUA Pasacao Campus. Establishing a baseline inventory is essential for understanding the current status of local biodiversity, identifying species requiring conservation attention, and guiding ecological management practices within the campus. Such data can also support future research, learning exercises, and campus-wide environmental programs. Thus, this study aims to document and assess the fauna present within CBSUA Pasacao Campus, identify their habitat associations, determine their ecological and conservation status, and generate science-based recommendations for biodiversity conservation and

campus sustainability.

Statement of the Problem - The Central Bicol State University of Agriculture (CBSUA) Pasacao Campus lacks a comprehensive inventory of fauna species within its grounds. Understanding the composition, and distribution of animal life in the area is essential for biodiversity conservation and ecological planning. This study aims to address this gap by documenting and assessing the fauna species present on campus. Specifically, the study seeks to answer the following questions: 1) What fauna species are present within the CBSUA Pasacao Campus? 2) What are the habitat types observed for these species within the campus? 3) What is the origin of the documented species, including whether they are native, endemic, introduced? 4) What is the conservation status of each identified species based on national or international conservation listings? 5) What infographic material can be designed to concisely present the CBSUA Pasacao Campus faunal findings as a permanent visual reference for school?

Objectives of the Study - The objective of this study is to conduct an inventory of fauna species within the Central Bicol State University of Agriculture (CBSUA) Pasacao Campus to serve as a baseline for biodiversity conservation and ecological planning. Specifically, this study aims to: 1) Identify and document the fauna species present within the CBSUA Pasacao Campus. 2) Determine the habitat types where these species are found. 3) To categorize the identified species based on their scientific classification and their origin (e.g., native, endemic, introduced). 4) To categorize the identified species based on their conservation status. 5) Provide a infographic material can be designed to concisely present the CBSUA Pasacao Campus faunal findings as a permanent visual reference for school.

Significance of the Study - The study documenting the fauna (animal species) of the CBSUA Pasacao Campus holds distinct and valuable benefits for multiple stakeholders from campus leaders to global conservation efforts.

- **Students and Educators.** This inventory creates a localized, living laboratory. Students gain vital, hands-on data for thesis work and field research. Educators receive current, relevant materials to integrate local biodiversity into the curriculum, improving the quality of environmental education.
- **CBSUA Administration.** The study provides the scientific baseline necessary for responsible land management. This data directly informs decisions on campus development, ensuring infrastructure minimizes damage to animal habitats. The inventory also boosts the campus's reputation, aiding its pursuit of research grants and conservation partnerships.
- **Environmental Agencies and Researchers.** The study fills a crucial regional data gap, offering a baseline for environmental agencies to monitor changes, assess development impacts, and locate wildlife corridors. Researchers benefit from comparative data essential for future long-term studies on species dynamics and environmental change.
- **Local Community.** The inventory fosters community awareness and pride in local natural heritage. Knowing the campus wildlife encourages responsible stewardship, helps mitigate human-wildlife conflict, and can potentially support local eco-tourism or other nature-based livelihood initiatives.
- **Policy Makers and Extension Workers.** The research delivers evidence-based data for effective policy. Policy Makers can use the findings (e.g., threatened species locations) to designate protected zones and integrate conservation into local ordinances. Extension Workers utilize this data to create targeted outreach programs for sustainable resource use and wildlife protection among community members.
- **Global Biodiversity Goals.** On a broader scale, the study contributes to global environmental commitments such as the United Nations Sustainable Development Goal 15: Life on Land, and the Kunming-Montreal Global Biodiversity Framework, which both underscore the urgency of conserving terrestrial ecosystems and halting biodiversity loss.

Scope and Limitation - This study focuses on the identification and documentation of fauna species within the Central Bicol State University of Agriculture (CBSUA) Pasacao Campus. It covers various animal groups, including mammals, birds, reptiles, amphibians, and insects found on the campus during the research period from year 2025. The study also examines the habitat types within the campus where these species are commonly observed and estimates their relative abundance. Data collection will be conducted through field observations, direct sightings, and interviews with knowledgeable personnel. The study is limited to fauna species present within the geographical boundaries of CBSUA Pasacao Campus only. It excludes species found outside the campus or in areas not accessible during the study period. Seasonal variations and migratory species may not be fully accounted for due to the limited duration of the study. The research focuses on visible and detectable fauna, and does not include microscopic or cryptic species that require specialized equipment or methods for identification.

Theoretical Framework - Niche Theory. A fauna inventory is, at its core, an empirical description of the filled niche spaces within the CBSUA Pasacao ecosystem, it answers the question of which species have successfully established their ecological roles in that specific location. Niche Theory is the framework that allows researchers to move beyond simply listing species to understanding the underlying habitat requirements and resource partitioning that determine the makeup of the entire community. Without this theoretical lens, the inventory is just raw data; with it, the data becomes a vital map of the local selective pressures and species-environment interactions, especially when considering findings which emphasize the unique local expression of the niche. This inventory will provides the direct evidence for applying Niche Theory by detailing the presence and abundance of specific fauna across the Pasacao landscape. The resulting species list is not just a census; it represents a comprehensive set of successful ecological strategies adapted to the local climate, vegetation, and resources. Future researchers will use the inventory to determine how each species survives (its niche), which then allows for conservation plans to focus on protecting the critical habitats and resources identified as essential for maintaining those local niches.

This will establish the initial population structure and genetic canvas upon which Evolutionary Dynamics operate. The raw counts and distribution data collected serve as the fundamental benchmark against which all future evolutionary change must be measured. For species found in small or isolated numbers, the inventory data is immediately necessary to assess the conservation risk. Therefore, the inventory is the starting condition required to test hypotheses about how natural selection, drift, and random events shape the Pasacao fauna over time. The inventory's quantification of species richness and relative abundance is the exact type of data required to test the assumptions of Neutral Theory. By providing the full list of species and their numbers, the study enables researchers to mathematically analyze whether the biodiversity patterns in Pasacao are best explained by purely random processes like ecological drift or by the predictable, niche-based processes.

Conceptual Framework - The conceptual framework of this study is anchored on the Input–Process–Output (IPO) model, which provides a systematic approach in identifying and analyzing the types of fauna species present at the Central Bicol State University of Agriculture (CBSUA) Pasacao Campus. In the input phase, essential resources and preliminary activities are utilized to gather accurate and reliable data, including the conduct of field surveys, the use of species identification tools such as field guides and mobile applications, and the deployment of sampling equipment like cameras, and data sheets; these components ensure that comprehensive raw data about fauna species are properly collected from various habitats within the study area. The process phase follows, wherein the collected data undergo a series of analytical procedures, starting with fauna identification to verify species accurately, followed by systematic data recording to organize observations, and ecological significance within the campus; this phase is crucial as it transforms raw field data into meaningful scientific information. Finally, the output phase presents the results of the study in the form of the creation of a large-format infographic chart—specifically a printed tarpaulin or permanent signage—serves as the primary tangible output of the fauna research conducted at the CBSUA Pasacao Campus. This material functions as a bridge between technical environmental data and community awareness, turning a scientific inventory into a public educational resource.

Definition of Terms - This section provides definitions of key terms used throughout the study to ensure clarity and a common understanding of concepts related to flora inventory and biodiversity assessment.

- **Baseline Data-** In this study, it specifically pertains to the initial records of fauna species gathered within the CBSUA Pasacao Campus, which will be used to guide future ecological monitoring and conservation efforts.
- **Biodiversity Conservation-** In this study, it refers to the proposed recommendations and actions aimed at maintaining and protecting the faunal diversity within the CBSUA Pasacao Campus.
- **Direct Sightings-** Direct sightings refer to the visual observation of organisms in their natural habitat without the use of indirect evidence or capture methods (Sutherland et al., 2020). In this study, it specifically denotes the actual visual encounters of fauna species by researchers during fieldwork at CBSUA Pasacao Campus.
- **Documentation-** Documentation is the systematic recording of observations, data, and findings using written, photographic, or digital means for analysis and reference (Creswell & Creswell, 2018). In this study, it refers to the written, photographic, and tabulated records of fauna species and their habitats within the CBSUA Pasacao Campus.
- **Ecosystem Health-** In this study, it describes the state of the CBSUA Pasacao Campus environment as reflected by the diversity and abundance of fauna species present.
- **Ecosystem Resilience-** In this study, it refers to the capacity of faunal populations within CBSUA Pasacao Campus to adapt to environmental changes and sustain their ecological roles.
- **Fauna-** In this study, it specifically includes all observable animal species found within the CBSUA Pasacao Campus during the research period.
- **Faunal Identification -** In this study, it refers to the compiled and documented list of animal species identified and recorded through field observation and surveys conducted at CBSUA Pasacao Campus.
- **Field Observation-** Field observation is a research method that involves directly studying and recording organisms in their natural environment (Creswell & Creswell, 2018; Sutherland et al., 2020). In this study, it refers to the systematic recording of fauna species by researchers across different habitats within CBSUA Pasacao Campus.
- **Species Identification-** In this study, it refers to the classification of fauna observed in CBSUA Pasacao Campus using field guides, taxonomic keys, and expert consultation.
- **Transect Walk-** In this study, it refers to the method of walking along designated lines within CBSUA Pasacao Campus to systematically record and identify fauna.

2. Methodology

This section outlines the overall research design and methods employed to achieve the study's objectives. It includes the Research Design, Research Method, Data Gathering Procedure, and Statistical Treatment of Data used in the documentation and assessment of flora species within CBSUA Pasacao Campus.

Research Design - This study utilized a descriptive research design, which is standard practice for biodiversity assessments and ecological inventories. This non-experimental approach was chosen because the primary goal was to systematically observe, record, and analyze the existing faunal characteristics of the CBSUA Pasacao Campus without manipulating any variables. campus. By focusing on what exists at the time of the study, this methodology provides a crucial, verifiable baseline inventory of the campus's fauna diversity, establishing foundational data essential for future ecological monitoring and conservation planning.

Research Method - The study employed a field-based observational method as its core research approach,

which was crucial for ecological and biodiversity inventories. This method involved researchers conducting direct, on-site assessments across the CBSUA Pasacao Campus to gather real-time data on faunal presence and distribution. This enabled the systematic collection of qualitative data by directly identifying, classifying, and recording various species without altering the natural environment. To ensure high accuracy and data consistency, essential tools such as field notebooks, species identification guides, and digital cameras were utilized. The observational method was specifically chosen for its effectiveness in generating reliable baseline data for the ecological documentation and assessment objectives of the study.

Data Gathering Procedure - The faunal identification was conducted using a highly structured, one-day Rapid Assessment Protocol (RAP) across primary Habitat Zones of the CBSUA Pasacao Campus. The Rapid Assessment Protocol (RAP) served as a systematic diagnostic tool used to categorize habitats as natural, modified, or impacted by evaluating qualitative environmental health and anthropogenic influence (Bersot et al., 2015). This flexible framework provided a robust basis for documenting biodiversity within the structured university landscape (Guimarães et al., 2017). To facilitate accurate species identification, the research utilized the iNaturalist platform, leveraging its crowdsourced biodiversity database to verify the taxonomic classification of recorded campus fauna. The procedure was scheduled to capture peak activity periods for different faunal groups. Data collection began at dawn (05:00-08:00) with Avifauna Point Counts conducted at the Secondary Growth and Open Fallow Grounds. By utilizing point counts, the study systematically documented key avian species such as the Yellow-vented Bulbul, providing critical data on how these birds distributed themselves across the various micro-ecosystems of the campus.

The late morning (08:00-11:00) employed Visual Encounter Surveys (VES) in the Fallow Grounds and Manicured Gardens to target insects and diurnal species. Habitats such as garden plots, leaf litter, and building perimeters were systematically surveyed via VES, a globally recognized method for effectively documenting herpetofauna across diverse settings (Tiberti et al., 2022). The midday hours were dedicated to the Time-Constrained Search (TCS), an intensive method for cryptic herpetofauna (amphibians and reptiles) within the Drainage/Water Sources and Utility/Storage Areas. This methodology enhanced sampling efficiency by utilizing fixed durations to document biodiversity in complex ecosystems where traditional surveys might have been impractical (González-Duarte & Megina, 2020).

The mist net technique and spotlighting were executed from dusk until 23:00, retracing routes near water sources and dense Secondary Growth to survey night-active species. Mist netting functioned as a specialized technique for safely capturing birds and bats that significantly enhanced inventory accuracy by detecting cryptic species (Stoleson et al., 2016; Polanco et al., 2015). To create the map, georeferenced data was captured in the field with Geo Cam Free, which embedded coordinates directly into photos. A Garmin device was used to record precise waypoints, which were then exported as KML or GPX files. These files were imported into Google Earth Pro to visualize field data against satellite imagery. For professional-grade analysis, the Manifold app (Release 8 or 9) was used to link datasets, leveraging its high-speed engine to handle spatial databases.

Statistical Treatment of Data - The statistical treatment of data for this study employed descriptive statistics to systematically organize and interpret the biological characteristics of the identified species. To analyze the type of fauna, frequencies were utilized to determine the taxonomic richness of the CBSUA Pasacao Campus, allowing for a clear identification of dominant groups such as insects, invertebrates, and arachnids. This was achieved by tallying the number of species within each taxonomic class and calculating their relative proportion against the total population of 24 species, providing a quantitative baseline for the campus's biodiversity.

The ecological and conservation status of the fauna were further analyzed through categorical classification and qualitative synthesis. Species were grouped based on their functional roles—including predators, detritivores, and herbivores—to provide insights into the trophic structure and nutrient cycling processes within the human-altered landscape. Simultaneously, each species was cross-referenced with the IUCN Red List of Threatened Species, with data summarized into categories such as Least Concern or Not Evaluated. These statistical methods

ensured that qualitative observations were transformed into a structured summary, facilitating a comprehensive assessment of the campus's overall biological profile and conservation value.

3. Result and Discussion

A human-altered landscape, also known as an anthropogenic landscape, refers to a natural environment that has been significantly modified by human activities such as urbanization, infrastructure development. These landscapes are characterized by habitat fragmentation, the introduction of non-native plant species, and constant human disturbance, which shift the ecological balance away from a pristine state. The CBSUA Pasacao Campus serves as an example of a human-altered landscape, as it functions as a mosaic of man-made habitats. Because the original forest cover was replaced or managed for institutional use, the campus now supports a specific community of generalist and synanthropic, which are organisms that have adapted to live near human activity and infrastructure. Insects make up the largest portion of this biodiversity, as they can exploit small ecological niches created by gardens, and waste areas. Anthropogenic landscapes like the CBSUA Pasacao Campus sustain resilient, fast-reproducing species that capitalize on resources such as artificial lighting and standing water. The survey documented a diverse assemblage of 24 species—including insects, birds, amphibians, reptiles, and various invertebrates—that have successfully occupied the niches provided by the campus's mixed habitats. By utilizing landscaped vegetation, agricultural plots, and built structures, these organisms form a complex ecosystem adapted to the specific conditions of a human-modified environment.

Table 1
The Identified Fauna species within CBSUA-Pasacao Campus

	Common Name	Scientific Name	Ecological Status	Conservation Status	Type of fauna	Habitat Type
Ants and Wasp	Black carpenter ant	<i>Camponotus pennsylvanicus</i>	Native	(NE) Not Evaluated	Insect	orchards or urban structures
	Orange gaster	<i>Oecophylla smaragdina</i>	Introduced	(LC) Least Concern	Insect	
	Wasp	<i>Brachymeria podgorica</i>	Introduced	(LC) Least Concern	Insect	gardens, forests
Beetle and Bug	Mealybugs	<i>Planococcus citri</i>	Introduced	(LC) Least Concern	Insect	suburban gardens
	Ladybug	<i>Coccinella septempunctata</i>	Introduced	(LC) Least Concern	Insect	Tropical and subtropical ecosystems
Bird	Yellow vented bulbul	<i>Pycnonotus goiavier</i>	Introduced	(LC) Least Concern	Bird	Semi-Open Landscapes.
Butterfly and Moth	Five Ring Butterfly	<i>Ypthima baldus</i>	Native	(LC) Least Concern	Insect	semi-open environments
	Cocoa tussock moth	<i>Orgyia definita</i>	Introduced	(LC) Least Concern	Insect	forested and suburban habitats
Dragonflies	Blue Dasher	<i>Pachydiplax longipennis</i>	Introduced	(LC) Least concern	Insect	
	Green Darner	<i>Anax junius</i>	Introduced	(LC) Least Concern	Insect	freshwater bodies
	Indonesian red-winged dragonfly	<i>Neurothemis terminate</i>	Introduced	(LC) Least Concern	Insect	
Frog	Asian Common Toad	<i>Duttaphrynus melanostictus</i>	Native	(LC) Least Concern	Amphibian	gardens and forests
Flies and Mosquito	blue bottle fly	<i>Calliphora vomitoria</i>	Introduced	(NE) Not Evaluated	Insect	moist, nutrient-rich microhabitats.
	Crane Fly	<i>Tipulidae</i>	Native	(LC) Least Concern	Insects	moist, nutrient-rich microhabitats.
	fruit fly	<i>Bactrocera dorsalis</i>	Native	(LC) Least Concern	Insect	Vegetated areas, orchards, and grasslands.
	Stilt Legged	<i>Mimegralla soerleifrons</i>	Native	(LC) Least Concern	Insect	
	Mosquito	<i>Culicidae</i>	Native	(LC) Least Concern	Insect	tropical and subtropical areas
Lizard	The marbled water monitor	<i>Varanus marmoratus</i>	Endemic	(LC) Least Concern	Reptiles	freshwater habitats
Snail	Asian Tramp Snail	<i>Bradybaena similaris</i>	Native	(LC) Least Concern	Invertebrate	gardens, agricultural lands, and vegetated areas
	Giant African snail	<i>Achatina fulica</i>	Introduced	(LC) Least Concern	Invertebrate	forests, gardens, agricultural areas, buildings, gardens, and
	Common	<i>Parasteatoda</i>	Introduced	(VU) Vulnerable	Arachnid	

Spiders	House spider Giant Wood Spider.	<i>tepidariorum</i> <i>Nephila pilipes</i>	Introduced	(NE) Not Evaluated	Arachnid	sheltered outdoor areas tropical forests, gardens, and vegetated areas
Worm and Millipede	Hammerhead Worm greenhouse millipede	<i>Bipalium kewense</i> <i>Oxidus gracilis</i>	Introduced	(LC) Least Concern	Invertebrate	gardens, forests
			Introduced	(LC) Least Concern	Millipede	moist habitats

3.1 Ants and wasp

The study at CBSUA Pasacao Campus identified three significant Hymenoptera: the native Black Carpenter Ant (*Camponotus pennsylvanicus*) and Weaver Ant (*Oecophylla smaragdina*), alongside the introduced wasp *Brachymeria podagrica*. The Black Carpenter Ant (*Camponotus pennsylvanicus*) and Weaver Ant (*Oecophylla smaragdina*) are specialized arboreal insects that exploit different botanical niches for nesting. While carpenter ants excavate protective galleries within the structural integrity of wood, weaver ants utilize silk to bind thick tropical foliage into complex external nests (Mackay, 2019; Exélis et al., 2025). Both species demonstrate significant adaptability, successfully transitioning from native forests into human-altered landscapes—such as orchards and urban structures—that mimic their natural nesting substrates. While the ants contribute to nutrient cycling and arboreal pest suppression as native generalist predators, the wasp—locally classified as Vulnerable—provides specialized bio-control by regulating disease vectors associated with filth-borne pathogens (Schuster & Sivakumar, 2024; Marchiori, 2022). Together, these species form a vital predatory guild that stabilizes the campus ecosystem by managing both agricultural pests and public health risks. The presence of native Black Carpenter Ants and Weaver Ants confirms a functional ecosystem capable of self-regulation and nutrient recycling, indicating sufficient habitat complexity. Meanwhile, the introduced wasp *B. podagrica* enhances sanitary ecology by providing a non-chemical solution for managing disease-carrying flies near refuse areas. Ultimately, these findings demonstrate that such small-scale insects provide essential ecosystem services that safeguard both the university's agricultural assets and public health.

3.2 Beetle and Bug

The fauna inventory at CBSUA Pasacao Campus identified two significant species representing the orders Coleoptera and Hemiptera: The Ladybug (*Coccinella septempunctata*) and the Mealybug (*Pseudococcus longispinus*). The Seven-spotted Lady Beetle (*Coccinella septempunctata*) is a highly mobile predator that thrives in suburban gardens, driven primarily by the abundance of aphids essential for its survival and larval development. To locate prey, the species employs a sophisticated detection system that tracks volatile chemical signals released by plants under aphid attack (Ahmad & Zahid, 2024). Beyond foraging, these habitats provide critical microhabitats—such as leaf litter and stone structures—that offer the thermal regulation and shelter necessary for successful overwintering and aestivation. Both are introduced species classified as Least Concern (LC). The Ladybug serves as a natural biological control agent by preying on aphids, though its limited presence during the survey may suggest competition or habitat loss (Majerus, 2021). In contrast, the Mealybug is a notorious agricultural pest that feeds on plant sap, causing chlorosis, growth retardation, and the spread of sooty mold. Field observations noted high concentrations of mealybugs on ornamental shrubs within humid, shaded campus microclimates, where their feeding activity resulted in visible plant damage. Identifying the Mealybug pinpoints the source of physiological damage to ornamental flora, establishing a baseline for proactive phytosanitary management. Conversely, the Ladybug inclusion emphasizes the role of beneficial insects in natural pest suppression; their observed scarcity suggests an ecological imbalance that may necessitate human intervention. Ultimately, these findings frame campus biodiversity as a functional network where the presence of key predators serves as a critical indicator of environmental stability and the effectiveness of integrated pest management strategies.

3.3 Bird

The Yellow-vented Bulbul (*Pycnonotus goiavier*) was recorded on the CBSUA Pasacao Campus as an introduced species with a conservation status of Least Concern. Originally native to southern Thailand, Cambodia, and Vietnam, this bird has demonstrated significant environmental adaptability by expanding its range into regions like Laos (Duckworth, 2015). The Yellow-vented Bulbul (*Pycnonotus goiavier*) is a resilient, opportunistic generalist that favors semi-open habitats like coastal scrubs, orchards, and urban gardens over dense forests. These environments provide the essential structural gaps required for its diverse foraging on fruits, nectar, and insects, while low bushes offer ideal nesting sites (Birds of the World, 2020). The Yellow-vented Bulbul (*Pycnonotus goiavier*) serves as a key frugivore on the CBSUA campus, providing the critical ecological service of seed dispersal. By consuming fruits from trees such as *Ficus nota*, these birds facilitate plant expansion across diverse habitats, acting as a natural catalyst for floral regeneration (Cancio & Rodriguez, 2024). This behavior underscores the importance of the campus's green spaces in maintaining local biodiversity through avian-led reforestation.

3.4 Butterfly and moth

The inventory at the CBSUA Pasacao Campus identified two distinct Lepidopterans: the introduced Tussock Moth (*Orgyia definita*) and the native Philippine Five-ring Butterfly (*Ypthima stelleri*). The Common Five-Ring (*Ypthima baldus*) thrives in semi-open transition zones, such as forest edges and urban parks, where a mix of sun and shade supports its thermal and moisture needs. Its presence in the open green spaces of the CBSUA–Pasacao Campus indicates that the campus offers the specific micro-habitats and diverse edge vegetation necessary for essential behaviors like thermoregulation and hydration (Fishpool & Tobias, 2020). While the Tussock Moth is a highly adaptable generalist often found in urban green spaces and bark crevices, the Philippine Five-ring is a native species that favors disturbed agricultural landscapes. Despite its presence in human-altered areas, research suggests *Y. stelleri* is relatively rare and occupies a specific ecological niche that may be sensitive to significant habitat shifts (Mangaoang & Mohagan, 2019). The documentation of these Lepidopterans is fundamental, as they serve as primary bioindicators of floral diversity and environmental health. The Tussock Moth illustrates active herbivory and trophic interactions with campus vegetation, while the presence of the rare Philippine Five-ring suggests that the university's grasslands still support the specific host plants required for its survival. By identifying these species, the research highlights the campus's role as a refuge for both resilient introduced insects and specialized native butterflies. Collectively, these findings provide a baseline for monitoring how landscaping and agriculture affect the pollinator-herbivore balance, ensuring the preservation of the campus's trees and grasslands.

3.5 Dragonflies

The faunal identification at the CBSUA Pasacao Campus identified three Odonata species that serve as vital indicators of aquatic and terrestrial health: the Green Darner (*Anax junius*), the Blue Dasher (*Pachydiplax longipennis*), and the Indonesian Red-winged Dragonfly (*Neurothemis terminata*). These dragonfly species—the Blue Dasher (*Pachydiplax longipennis*), Green Darner (*Anax junius*), and Indonesian Red-winged Dragonfly (*Neurothemis terminata*)—serve as ecological indicators for the CBSUA–Pasacao Campus. Their life cycles depend on healthy freshwater habitats where aquatic plants provide essential sites for egg-laying and larval development (Suhling et al., 2016; Dijkstra et al., 2020). Both the Green Darner and Blue Dasher are highly mobile predators known for controlling mosquitoes and orchard pests, while also acting as biological indicators of wetland quality. The introduced Indonesian Red-winged Dragonfly utilizes specialized visual adaptations to efficiently hunt larger prey within the campus's ponds and drainage systems (Duong, 2017; Deb et al., 2019). Collectively, these dragonflies form a predatory guild that stabilizes the campus ecosystem through effective natural pest regulation. The inclusion of these dragonflies is fundamental, as they serve as sensitive bioindicators of the campus's freshwater quality and overall environmental integrity. Because dragonflies require specific aquatic conditions for their nymphal development, the presence of *A. junius*, *P. longipennis*, and *N. terminata* suggests that campus drainage systems and water features are healthy enough to support complex life cycles. Their

documentation confirms an active biological control system where dragonflies naturally suppress disease-carrying mosquitoes and agricultural pests, reducing the need for chemical intervention. Additionally, the coexistence of native and introduced odonates highlights the campus's resilience as a habitat capable of supporting diverse species within human-managed water sources.

3.6 Frog

The Asian Common Toad (*Duttaphrynus melanostictus*) was documented at the CBSUA Pasacao Campus with a Native and Least Concern (LC) status. This ranking reflects its broad distribution across Asia and the Philippines, as well as its high adaptability to both forested and human-modified environments (IUCN, 2022). The Asian Common Toad (*Duttaphrynus melanostictus*) is a highly adaptable amphibian whose presence on the CBSUA–Pasacao Campus highlights the area's ability to provide the essential moisture, shaded cover, and standing water required for its terrestrial survival and aquatic reproduction (Mohanty & Measey, 2019). However, despite its stable global population, the species remains highly sensitive to localized environmental stressors. Factors such as air and water pollution, along with the degradation of breeding sites like canals and pools, pose significant risks to its survival (IUCN, 2022). As primary predators of ground-dwelling invertebrates, these organisms serve a vital role in maintaining the ecological equilibrium of the environment (Narins et al., 2018). By preying on ants, beetles, and termites, the species exerts a natural pressure that regulates insect density, ensuring the campus ecosystem functions in accordance with established biological expectations.

3.7 Flies and Mosquito

The faunal survey at the CBSUA Pasacao Campus identified a diverse Diptera assemblage, including the Oriental Fruit Fly (*Bactrocera dorsalis*), Crane Fly (Family Tipulidae), Bluebottle Fly (*Calliphora vomitoria*), Stilt-legged Fly (Family Micropezidae), and Mosquitoes (Family Culicidae). Most are native species classified as Least Concern (LC). The Blue Bottle Fly (*Calliphora vomitoria*) and Crane Fly (Tipulidae) serve as critical decomposers on the CBSUA–Pasacao Campus, utilizing damp waste zones and leaf litter to facilitate nutrient recycling and sustain soil health (Amendt et al., 2017; Petersen, 2019). Similarly, the Oriental Fruit Fly (*Bactrocera dorsalis*) and Stilt-Legged Fly (*Mimegralla coeruleifrons*) exploit the campus's diverse vegetation for reproduction and protection, contributing to the ecosystem as both nutrient cyclers and essential prey (Marshall, 2017; Vargas et al., 2018). The Oriental Fruit Fly is a prolific breeder in orchards, while Crane Flies and Mosquitoes rely on the campus's moist, shaded habitats and standing water (Harbach, 2015). The Stilt-legged Fly is noted for its unique ant-mimicry, whereas the introduced Bluebottle Fly serves a critical role in decomposition and forensic entomology (Marchiori, 2022). Together, these taxa represent a wide functional spectrum, acting as agricultural pests, disease vectors, decomposers, and primary prey for larger campus predators.

3.8 Lizard

The marbled water monitor (*Varanus marmoratus*), was recorded on the CBSUA Pasacao Campus with an Ecological Status of endemic and a Conservation Status of least concern. The Marbled Water Monitor (*Varanus marmoratus*) is a large Philippine endemic that thrives near freshwater habitats and mangroves, where it hunts fish, small animals, and carrion. Its presence on the CBSUA–Pasacao Campus confirms the availability of aquatic resources and dense vegetation essential for the survival of this opportunistic predator (Luna & Rausell-Moreno, 2024). Large and noticeable, the Marbled Water Monitor (*Varanus marmoratus*) is an endemic species of the Philippines that is especially prevalent on a number of islands in Luzon. Despite the IUCN's current classification of the species as Least Concern, threats like human encroachment, hunting pressure, and its capture for the illicit pet trade put its population in constant danger (de Miranda, 2017). The significance of the monitor as a well-known, endemic Philippine predator found in the Luzon region is established by this study, significantly increasing the campus's conservation value. Additionally, it highlights the potential role of the CBSUA Pasacao Campus as a protective refuge for this delicate species by mentioning threats from human encroachment and the illegal pet trade.

3.9 Snail

The faunal inventory at the CBSUA Pasacao Campus identified two significant terrestrial gastropods: the Asian Tramp Snail (*Bradybaena similaris*) and the Giant African Snail (*Achatina fulica*). The Asian Tramp Snail (*Bradybaena similaris*) and Giant African Snail (*Achatina fulica*) are land mollusks that thrive in the warm, humid, and vegetation-rich environments of the CBSUA–Pasacao Campus. While *B. similaris* flourishes in moist gardens and agricultural patches (Hajian-Forooshani et al., 2020), the larger *A. fulica* acts as a generalist herbivore that spreads rapidly in tropical zones with abundant organic debris and plant resources (Yu et al., 2024; Alogna et al., 2025). Together, their presence confirms that the campus provides the high moisture levels and dense greenery necessary to support diverse malacofauna. While the Asian Tramp Snail is Native to the region and classified as Least Concern, it is globally regarded as a pervasive invasive species and a vector for parasites affecting humans and livestock (Serniotti et al., 2019). Campus observations confirm its preference for damp micro-habitats like garden soil and potted plants. In contrast, the Giant African Snail is an Introduced species from East Africa that thrives in human-disturbed environments. The documentation of these gastropods is central to the study, as they serve as primary indicators of how human-altered landscapes facilitate the establishment of resilient and potentially invasive taxa. By identifying these species, the research characterizes the campus as a dynamic mosaic of man-made habitats where adaptable native and introduced species dominate the ecological balance. Furthermore, including *B. similaris* and *A. fulica* bridges biological documentation with institutional management by establishing a baseline for public health and agricultural risks. These findings emphasize that a "Least Concern" or "Introduced" status does not negate a species' ecological impact; instead, it underscores the university's responsibility to manage these synanthropic organisms to maintain a safe and stable environment.

3.10 Spiders

The faunal identification at the CBSUA Pasacao Campus identified two spiders with contrasting ecological profiles: the Giant Wood Spider (*Nephila pilipes*) and the Common House Spider (*Parasteatoda tepidariorum*). The Common House Spider (*Parasteatoda tepidariorum*) and Giant Wood Spider (*Nephila pilipes*) represent two distinct hunting strategies found on the CBSUA–Pasacao Campus, where they play a vital role in regulating insect populations. While *P. tepidariorum* thrives in both buildings and gardens by spinning irregular cobwebs to capture mosquitoes and flies (Nyffeler & Birkhofer, 2017), *N. pilipes* utilizes the campus's dense greenery to anchor expansive circular orb-webs designed for larger flying prey (Kuntner et al., 2019). The presence of both species underscores a robust ecosystem characterized by high insect density and the diverse structural supports—from man-made structures to tropical foliage—necessary for these predatory arachnids to flourish. The Giant Wood Spider is a Native species of Least Concern that typically inhabits rainforests; however, in modified landscapes like gardens, it often adapts by building smaller webs, which may reduce its overall fitness (Wijerathna et al., 2019). The inclusion of these arachnids is vital, as they serve as physical bioindicators of habitat quality and the campus's functional trophic structure. The Giant Wood Spider (*N. pilipes*) signals environmental stability and a healthy insect biomass, as its large webs require substantial high-energy prey to sustain its size. Meanwhile, the Common House Spider (*P. tepidariorum*) highlights the campus as a human-designed micro-ecosystem, where artificial structures provide niches for natural pest suppression.

3.11 Worm and Millipede

The faunal survey at the CBSUA Pasacao Campus identified two soil-dwelling invertebrates that define the ground layer's decomposition and predatory dynamics: The Greenhouse Millipede (*Oxidus gracilis*) and the Hammerhead Worm (*Bipalium kewense*). Both are Introduced species with a conservation status of Not Evaluated (NE). The Greenhouse Millipede acts as a primary detritivore, specializing in the breakdown of decaying plant litter and wood within the campus's managed landscapes. In contrast, the Hammerhead Worm is a specialized predator that thrives in moist, organic-rich environments, where it preys on earthworms essential for soil health (Justine et al., 2020). Together, these organisms illustrate a subterranean ecology where introduced species drive

both nutrient cycling and the regulation of soil-dwelling populations. The identification of Greenhouse Millipede (*Oxidus gracilis*) and the Hammerhead Worm (*Bipalium kewense*), is a critical finding that reinforces the classification of the campus as a human-altered landscape. The Greenhouse Millipede provides physical evidence of active nutrient cycling, confirming that the campus's managed gardens are successfully recycling nitrogen and phosphorus through leaf litter decomposition. Conversely, the presence of the Hammerhead Worm introduces an ecological concern, as its predation on earthworms may threaten the long-term soil quality of agricultural and garden zones. By documenting these species, the research highlights how campus biodiversity is shaped by cosmopolitan taxa that follow human activity. This baseline data is essential for monitoring the balance of soil organisms, ensuring that the benefits of detritivores are not compromised by invasive predators that target vital soil-health engineers.

4. Findings

The biological inventory of the CBSUA Pasacao Campus reveals an ecosystem heavily dominated by the class Insecta, which comprises 15 of the 24 identified species. This prevalence highlights the high adaptability of insects to human-altered landscapes, where they thrive alongside a smaller presence of arachnids and other invertebrates. In contrast, larger or more specialized fauna—such as birds, reptiles, and amphibians—are significantly less common, each represented by only a single species. This distribution suggests that the current campus environment favors resilient, generalist organisms while presenting greater survival challenges for more sensitive or specialized wildlife. The campus's ecological balance is further defined by a high proportion of introduced species, which outnumber native fauna nearly two-to-one and include only one documented endemic species. This indicates that the managed vegetation and human activity on campus create a favorable niche for non native or invasive species, potentially placing pressure on indigenous wildlife through resource competition. While the majority of these inhabitants are classified as Least Concern, the presence of a vulnerable species and several Not Evaluated organisms underscores the need for careful monitoring. Ultimately, the man-made gardens serve as critical urban oases, acting as the primary biological centers that sustain the campus's remaining biodiversity.

5. Conclusion

The CBSUA–Pasacao Campus functions as a specialized, human-altered habitat that favors small, particularly insects—at the expense of specialized vertebrate fauna. The current ecosystem reflects a simplified trophic structure where the original natural forest has been replaced by infrastructure, leaving human-managed gardens as the sole biological hubs for survival. These man-made green spaces are now the primary determinants of the campus's biodiversity, serving as vital refuges for the remaining wildlife in a fragmented landscape. While the campus supports a high degree of common species classified as Least Concern, it is increasingly characterized by an ecological imbalance where introduced, non-native species dominate. This transformation suggests that the campus acts more as a corridor for hardy, cosmopolitan invaders than as a primary habitat for unique Philippine biological heritage. However, the presence of vulnerable and endemic species indicates that these grounds still hold significant conservation value; the survival of these sensitive organisms depends entirely on how human landscaping and environmental management are maintained in the future.

Recommendations - To strengthen the ecological health of the CBSUA–Pasacao Campus, the university should transition toward a Green Corridor and Habitat Enrichment strategy. By prioritizing the planting of native trees and shrubs, the campus can create specialized niches that provide food and nesting resources for underrepresented groups like birds, reptiles, and endemic fauna. This approach fosters a more competitive environment for indigenous species to flourish alongside introduced ones. Additionally, the university should implement Habitat Patch Management by preserving undisturbed leaf-litter layers and creating small wetland zones, which are essential for the survival of amphibians and sensitive soil dwelling invertebrates. Beyond physical landscaping, the community must adopt nature-friendly policies and active preservation habits. This includes establishing designated Buffer Zones to minimize human foot traffic high-biodiversity areas and avoiding the use of harmful chemical sprays that threaten beneficial pollinators. Students and staff are encouraged to participate in

garden protection and pollinator-friendly practices, such as allowing wildflowers to grow in select areas. Based on the recorded fauna inventory, it is recommended that Science teachers develop localized instructional materials (SIMs) that use campus-specific species to make ecology more relatable to students. Finally, integrating regular biodiversity monitoring into the campus curriculum will ensure that these conservation efforts are data-driven, helping to track the long-term recovery of the campus's most vulnerable biological inhabitants.

Practical Educational Implications -Since International Journal of Research Studies in Education is an education-focused journal, this study must clearly explain the practical educational implications of its findings. The documentation of fauna species within the Central Bicol State University of Agriculture Pasacao Campus is important not only for biodiversity conservation but also for improving teaching, learning, and campus environmental management. The presence of different animal species shows that the campus serves as an ecological learning space where education and environmental protection work together. These findings provide useful knowledge that can support academic instruction, student learning, and institutional planning. For teachers and educational practitioners, the study provides localized learning materials using actual fauna species found within the campus. This makes lessons in biology, ecology, and environmental science more practical and meaningful. Teachers can also use the findings for field activities, species observation, and outdoor learning to improve student engagement. For students, the study increases awareness of local biodiversity and encourages environmental responsibility. It helps them understand the importance of protecting species found within their own campus. Students also develop important scientific skills such as observation, classification, and species identification through direct learning experiences. For school administrators and institutional planners, the findings provide a basis for responsible campus development and land management. Protecting green spaces, vegetation, and water sources helps preserve animal habitats and supports biodiversity. This creates a healthier and more sustainable learning environment for everyone.

The study also supports environmental policies and extension programs of the university. The infographic output can serve as a permanent educational reference for students, visitors, and the local community. This helps promote awareness of biodiversity conservation and strengthens the institution's role in environmental education. The study shows that preserving fauna species within the campus is important for both ecological balance and quality education. It strengthens environmental learning, supports sustainability, and helps the university produce environmentally responsible students and future professionals.

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Calcium-fortified pasta from milkfish bone powder: A sustainable food innovation

Correa, Elvira Shiey C. ✉

Camarines Sur Polytechnic College, Philippines (elcorrea@my.cspc.edu.ph)

Gadiano, Joshua G.

Camarines Sur Polytechnic College, Philippines (jogadiano@my.cspc.edu.ph)



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Abstract

Fishery production generates significant solid waste, primarily fish bones, which remain largely underutilized and contribute to environmental concerns despite being rich sources of protein, collagen, calcium, and phosphorus. The utilization of milkfish (*Bangus*) bones offers a sustainable alternative for developing nutrient-rich food products because of their high mineral content, particularly calcium and phosphorus, which are essential for bone development and overall health. This study aimed to investigate the utilization of milkfish bone powder in pasta production as a value-added product derived from fish-processing by-products. Specifically, the study evaluated the nutritional enhancement, physicochemical properties, microbial safety, and sensory acceptability of milkfish bone-fortified pasta. The study employed an experimental research design with four levels of milkfish bone powder incorporation, namely Treatment A (Control) with 0% milkfish bone powder, Treatment B with 25% milkfish bone powder (60 g), Treatment C with 50% milkfish bone powder (120 g), and Treatment D with 75% milkfish bone powder (180 g). The pasta formulations were prepared by mixing wheat flour, milkfish bone powder, eggs, salt, and water, followed by dough kneading, rolling, cutting, drying, and packaging. Chemical analyses were conducted to determine moisture content, ash content, crude protein, crude fat, crude fiber, carbohydrate, calcium, and phosphorus levels. Sensory evaluation was conducted among thirty (30) selected Hospitality Management students and faculty members using a 5-point Likert scale to assess appearance, aroma, texture, taste, and overall acceptability. Rank preference testing and statistical analyses, including ANOVA, Kruskal-Wallis, Mann-Whitney, and Duncan's Multiple Range Test (DMRT), were also performed. Results revealed that increasing the concentration of milkfish bone powder significantly improved the mineral composition of the pasta, particularly calcium and phosphorus content. The fortified pasta also demonstrated increased ash, crude protein, and crude fiber content while showing lower moisture and carbohydrate levels, indicating an improved nutritional profile and enhanced shelf stability. Among the treatments, Treatment C

(50% milkfish bone powder) obtained the highest average mean score of 4.33, interpreted as “Very Acceptable,” due to its balanced appearance, aroma, texture, and taste without producing an overpowering fish flavor. In contrast, the highest concentration (75%) resulted in lower sensory acceptability because of its darker appearance and stronger fish taste. The findings indicate that milkfish bone powder can be effectively incorporated into pasta production as a functional food ingredient while maintaining consumer acceptability. Furthermore, the study highlights the potential of utilizing fishery by-products as sustainable and economically valuable food ingredients. The production of calcium-enriched pasta using milkfish bone powder may contribute to improved nutrition, waste reduction, and sustainable food innovation. Since consumers increasingly prefer healthier and functional food products, milkfish bone-fortified pasta has strong potential for commercialization as a nutritious alternative to conventional pasta products while supporting environmental sustainability and circular economy practices.

Keywords: calcium-fortified, milkfish bone powder pasta, sensory evaluation, product development, food innovation, sustainable utilization

Calcium-fortified pasta from milkfish bone powder: A sustainable food innovation

1. Introduction

Pasta is a staple cereal-based product made from durum wheat semolina or alternative flours, widely consumed because it is affordable, versatile, and easy to prepare, making it a key component of modern diets across many regions of the world (Global Tribune, 2025; EBSCO, 2022). In recent years, pasta has also become a platform for innovation, with producers offering whole-grain, high-fiber, gluten-free, and high-protein variants to respond to changing consumer preferences and health concerns (Biernacka et al., 2022; Maximize Market Research, 2026). From 2020 onward, global pasta consumption and market size have shown steady growth, driven by the demand for convenient foods and by the recovery of the foodservice sector after the pandemic (Global Tribune, 2025; Mordor Intelligence, 2026). Industry analyses indicate that the global pasta market is expected to continue expanding at around 4–5% compound annual growth rate from the mid-2020s to early 2030s, reaching well over 100 billion USD in value, reflecting robust consumer demand in both retail and catering channels (Fortune Business Insights, 2024; Mordor Intelligence, 2026). Household survey data also show that in some countries more than half of consumers report eating pasta regularly, underlining its role as a common, repeat-purchase food item (Statista, 2025).

Nutritionally, pasta provides complex carbohydrates as a primary energy source and, when produced from whole grains or enriched flours, can contribute meaningful amounts of fiber, B vitamins, iron, and other micronutrients (Marcin, 2020; EBSCO, 2022). Recent research on “innovative” or reformulated pasta highlights that high-fiber and functional pasta products may help improve satiety and support reductions in blood pressure, cholesterol levels, and risks associated with certain chronic diseases when included as part of an overall balanced diet (Biernacka et al., 2022). These nutritional advantages, combined with compatibility with vegetables, lean proteins, and healthy oils, help explain pasta’s popularity in dietary patterns that aim for both health and convenience (Marcin, 2020; EBSCO, 2022).

One of the important advantages of pasta from a technological and economic point of view is its relatively long shelf life, especially in dried form, which facilitates storage, transport, and stock management for both households and the food industry (Circle Economy, 2026; Epicurious, 2022). Technical references estimate that properly packaged dried pasta typically maintains quality for around two years, and sometimes longer if kept in dry, airtight conditions, whereas fresh refrigerated pasta has a much shorter safe storage time of only a few days (Epicurious, 2022). This long shelf life contributes to pasta’s role as a “pantry staple” and supports its use in emergency stocks, institutional catering, and large-scale food distribution systems (Circle Economy, 2026).

Overall, recent market reports portray pasta as a mature but growing product category in which demand is being strengthened not only by its affordability and long shelf life but also by evolving consumer interest in healthier, more sustainable, and more specialized products (Maximize Market Research, 2026; Torg, 2026). The combination of rising consumption rates in many markets, continuous product innovation, and its favorable nutritional and storage characteristics suggests that pasta will remain an important commodity in the global food system in the coming years (Fortune Business Insights, 2024; Mordor Intelligence, 2026). Malnutrition and calcium deficiency remain important public health concerns, particularly among children, adolescents, and older adults. Calcium is an essential mineral needed for bone formation, muscle function, nerve transmission, and prevention of bone-related diseases such as osteoporosis. However, many populations fail to meet the recommended dietary calcium intake because of limited access to calcium-rich foods or the high cost of commercial supplements. One practical strategy to address this issue is the development of affordable and nutrient-enriched food products using locally available resources.

In the Philippines, milkfish (*Chanos chanos*), locally known as bangus, is one of the most widely consumed

fish species. During fish processing, large quantities of bones are discarded as waste, contributing to environmental pollution and inefficient utilization of fishery resources. Studies have shown that fish bones are rich sources of calcium, phosphorus, collagen, and other minerals, making them suitable for conversion into nutrient-rich powder for food fortification. Utilizing milkfish bone powder in food products supports sustainable food systems and promotes waste valorization in the fisheries sector.

Filipinos on the other hand, have a deep fondness for snacks and party foods, with pasta noodles like sweet spaghetti and stir-fried pancit being staples at celebrations and merienda. Ilocos Region features many pasta-based dishes, such as Linaddit (or Miki Laddit), a comforting noodle soup with flat miki noodles, annatto, and meat; Mami, a simple chicken or beef noodle soup; and Pansit Miki, a stir-fried variant popular in local eateries. These hearty, affordable noodles reflect the area's fusion of Chinese-influenced cuisine and local ingredients, often served at parties or as street food. The Ilocos Region excels in milkfish production through aquaculture, with facilities like Pangasinan's new hatchery supporting over 40,000 fisherfolk and cutting import reliance (Bureau of Fisheries and Aquatic Resources [BFAR], 2023). Milkfish accounts for a major share of the region's nearly 27,000 metric tons of annual aquaculture output (Philippine Statistics Authority, 2022). This abundance positions bangus bones as a sustainable byproduct, linking aquaculture to innovative food applications in a region where fisheries continue to rebound from challenges.

Milkfish (Chanos chanos), locally known as bangus, ranks among the most widely consumed fish in the Philippines. Its processing generates substantial by-products, especially fish bones, which are often discarded despite their high calcium and mineral content (Bureau of Fisheries and Aquatic Resources [BFAR], 2020). Improper disposal of these bones exacerbates environmental waste and overlooks potential for value-added food products. Milkfish bones are nutrient-dense, offering high calcium (up to 4% or 4820 µg/g in extracts), phosphorus (around 3%), and protein (32%), essential for bone health, preventing osteoporosis, and supporting growth. These minerals strengthen teeth and bones when added to pasta, enhancing the nutritional profile of Filipino favorites without significantly altering their taste. (Akbar, F. H., Salam, M., Latunra, A. I., et al. (2022).

Despite the increasing interest in food fortification and sustainable food innovation, limited studies have focused specifically on the incorporation of milkfish bone powder into noodle products. Existing studies often concentrate on other fish species or bakery products rather than staple noodle formulations. Therefore, this study seeks to develop calcium-fortified pasta from milkfish bone powder and evaluate their nutritional quality, sensory acceptability, and potential contribution to sustainable food innovation.

This study addresses several important research gaps related to food fortification and sustainable food innovation. Although milkfish processing generates a significant amount of bone waste, there is still limited research on transforming these by-products into valuable food ingredients suitable for human consumption. Previous studies have explored the use of fish bone powder in products such as crackers, bread, and snacks; however, only a few have investigated its incorporation into noodle or pasta production, particularly using milkfish bones. Moreover, there is insufficient information regarding the sensory acceptability of fortified pasta, specifically in terms of taste, texture, aroma, appearance, and overall consumer preference. The study also fills the gap in research integrating nutritional enhancement with environmental sustainability through the utilization of fishery by-products. Furthermore, most existing studies were conducted in foreign settings or focused on other fish species, highlighting the need for localized research using abundant Philippine milkfish resources.

The significance of this study extends to various sectors. For consumers, the research may provide a healthier and calcium-enriched pasta alternative that can help support bone health and overall nutrition. For the food industry, the findings may serve as a basis for the development of innovative functional food products utilizing fishery by-products. Fish processors and the fisheries sector may benefit from the productive use of milkfish bone waste, helping reduce environmental disposal issues while increasing the economic value of fish-processing residues. The study may also contribute to academic research by serving as a reference for future investigations related to food fortification, sustainable food innovation, and functional foods. Moreover, government agencies and nutrition

programs may use the findings to support nutrition intervention initiatives and promote affordable nutrient-enriched food products. Lastly, the study supports environmental sustainability by encouraging circular economy practices through the conversion of fish waste into valuable and useful food ingredients.

The study will employ an experimental research design varying concentrations of milkfish bone powder incorporated into pasta formulation. The study aims to evaluate the nutritional enhancement, physicochemical properties, microbial safety, and sensory acceptability of calcium-fortified pasta.

2. Materials and Methods

Materials - Fresh milkfish (bangus) bones, wheat flour, eggs, salt, and water. While, the other Materials and Equipment – Grinder, sieve, mixing bowls, weighing scale, rolling pin or pasta maker, knife and chopping board, cooking pot, drying trays, stove, and packaging materials; sterile polyethylene bags

Preparation of Milkfish Bone Powder

- *Collection and Cleaning* - Milkfish bones were collected from the local market. The bones were washed thoroughly under running water to remove adhering flesh and impurities.
- *Boiling and Degreasing* - The cleaned bones were boiled for 30-60 minutes to remove residual fats and proteins. Excess oil and tissues were manually removed.
- *Sterilization and Drying* - Bones were pressure-cooked to soften them and reduce microbial contamination. Afterwards, bones will be dried in an oven at 60-80⁰ C for 12-24 hours until completely dehydrated.
- *Pulverization* - The dried bones were ground using a grinder and sieve to obtain fine milkfish bone powder with uniform particle size.

Formulation of Calcium-Fortified Pasta

Table 1
Four Pasta Noodle Treatments

TREATMENT	WHEAT FLOUR (%)	MILKFISH BONE POWDER (%)
T1 (control)	100	0
T2	180	60
T3	120	120
T4	60	180

The dry ingredients were mixed thoroughly, followed by the addition of eggs, water, and salt. Dough was kneaded until smooth and elastic.

Noodle Processing

- Dough resting for 20-30 minutes.
- Sheet rolling using a pasta noodle tool
- Cutting into noodle strands
- Drying at controlled temperature until desired moisture content is achieved
- Packaging in sterile polyethylene bags

Observed parameters - Parameters which were observed in the present consisted of chemical properties and sensory evaluation. Chemical analysis was performed by measuring moisture content, ash content, crude protein content, crude fat content, carbohydrate content and calcium levels of the pasta. Sensory evaluation such as

appearance, aroma, taste, texture and overall acceptability.

Data Analysis - This research is experimental with a completely randomized design. The data obtained were analyzed using IBM Statistics SPSS version 22. The sensory evaluation was analyzed using the Kruskal-Wallis statistical test and then further tested with Mann-Whitney. The proximate analysis test data of pasta were analyzed using One-Way Analysis of Variance (ANOVA) and with Duncan's Multiple Range Test (DMRT) for further analysis at a 95% confidence level.

3. Results and Discussion

3.1 Chemical Properties

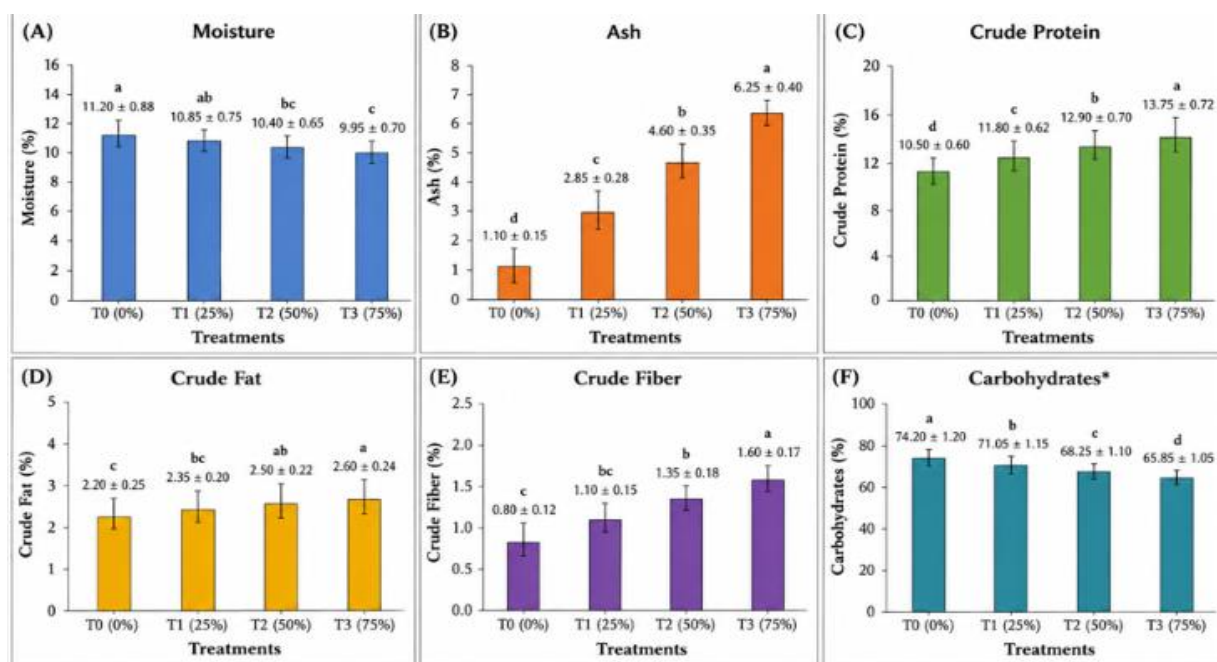


Figure 1. Proximate composition of the product as affected by the addition of milkfish bone powder at different concentrations. (A) Moisture, (B) Ash, (C) Crude Protein, (D) Crude Fat, (E) Crude Fiber, (F) Carbohydrates. Values are means $\pm$ standard deviation ($n = 3$). Bars with different letters are significantly different ($p < 0.05$) using ANOVA followed by Duncan's Multiple Range Test (DMRT).

Moisture content - The moisture content in pasta ranged from 11.20 to 9.95%, Figure 1. Results revealed that the moisture content decreases progressively with increasing levels of milkfish bone powder. The pattern may attribute to lower water-holding capacity of bone powder compared to wheat flour, which contributing to improved shelf stability and reduced microbial susceptibility (Bianchi et al., 2021).

Ash Content - The ash content in a product was closely related to the mineral content in an ingredient, the purity and cleanliness of a material produced (Sudarmadji (1997). The results show, there is a substantial increase of ash content among treatments, as seen on Figure 1. From 1.10 to 6.25% with the addition of milkfish bone powder. This reflects the high mineral content of milkfish bone powder, confirms their effectiveness as a fortifying agent. Similar findings have been reported in studies utilizing fishbone powder to enhance mineral composition in food products (Perez et al., 2024); Nemati et. al., (2016).

Crude Protein Content - ANOVA test result showed that the addition of milkfish bone powder significantly affected the levels of crude protein content in pasta $p < 0.05$. Crude protein content gradually increased with higher substitution levels that indicates the contribution of residual protein from milkfish bone. However, the increase was moderate, it demonstrates an improvement in the nutritional profile of the pasta, consistent with previous research on fish-based fortification (Mathew et al., 2022; Liaqat et al., 2022).

Crude Fat Content - The crude fat content of pasta in all treatments ranged from 2.20 to 2.60%, Figure 1. The highest crude fat content was obtained from pasta with the addition of milkfish bone powder, 2.60%. The results showed that the addition of milkfish bone powder significantly affected pasta fat content. The higher the concentration of the addition of milkfish bone powder, the lower the crude fat content. According to Pratama et al., 2014 the loss of fat content can occur due to protein unfolding in tissues to a degree that can cause a significant decrease in the emulsion stability of protein. Additionally, according to Windsor (2001), the protein will coagulate if the material is heated so that a lot of fat will come out.

Crude Fiber Content - The crude fiber content increased with higher addition of milkfish bone powder concentration may be associated with indigestible components present in bone powder. According to Paramita & Sahubawa (2022), an increased fiber content contributes to improve digestive health and enhances functional value of the product.

Carbohydrates Content - The content of carbohydrate decreases as the level of added milkfish bone powder increases. This is expected due to the partial replacement of wheat flour which is the primary carbohydrate source with milkfish bone powder. According to Paramita & Sahubawa (2022), the observed reduction indicates a shift toward a more nutrient-dense formulation.

Calcium Content - Calcium levels in pasta were measured at 0.00 to 18%, Figure 2. The highest level of calcium content was found in the pasta with the addition of 75% milkfish bone powder, with an average value of 18%. ANOVA test results showed that the addition of milkfish bone powder significantly affected the calcium content in pasta. The higher the concentration of the addition of milkfish bone powder, the higher the calcium content in the pasta. That is because milkfish bones contain high calcium. The Food and Nutrition Board of the National Academies of Sciences, Engineering, and Medicine established the Recommended Dietary Allowance (RDA) for calcium based on age and sex. The recommended intake for adults aged 19–50 years is approximately 1,000 mg (10grams) per day, while women aged 51 years and older and adults over 70 years require about 1,200 mg (12 grams) daily due to increased bone loss associated with aging. Adolescents aged 9–18 years require the highest intake at around 1,300 mg (13grams) per day because of rapid bone development during growth.

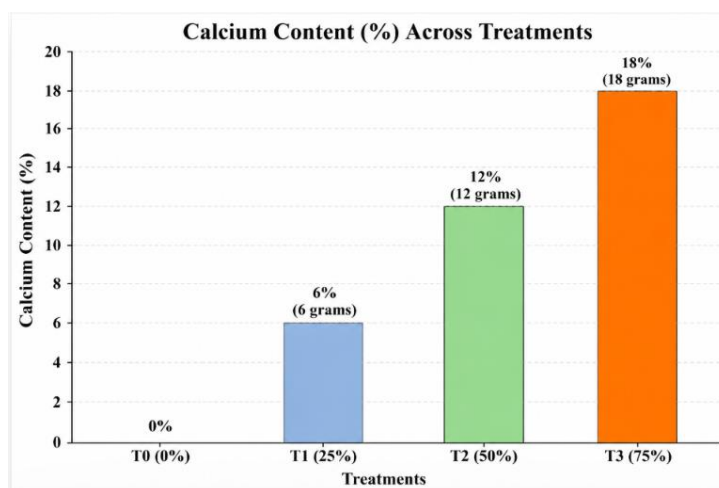


Figure 2. Calcium levels of the product affected by the addition of milkfish bone powder at different concentrations.

Phosphor Content - Chemical analysis showed that the phosphorus content in pasta was 0.18 - 0.63%, Figure 3. The highest level of phosphorus was found in pasta with the addition of 75% of milkfish bone powder, an average value of 0.63%. The test results showed the addition of fishbone meal significantly affected the pasta's phosphorus levels. The difference in concentration of addition of fishbone meal leads to different phosphorus levels of pasta. The higher the addition of milkfish bone powder concentration to the pasta, the higher the value of the phosphorus content. This could be due to a milkfish bone powder contains a high level of phosphorus. Fishbone

meal contains nano calcium and calcium-phosphorus which have the highest availability among other calcium (Lestari, 2001).

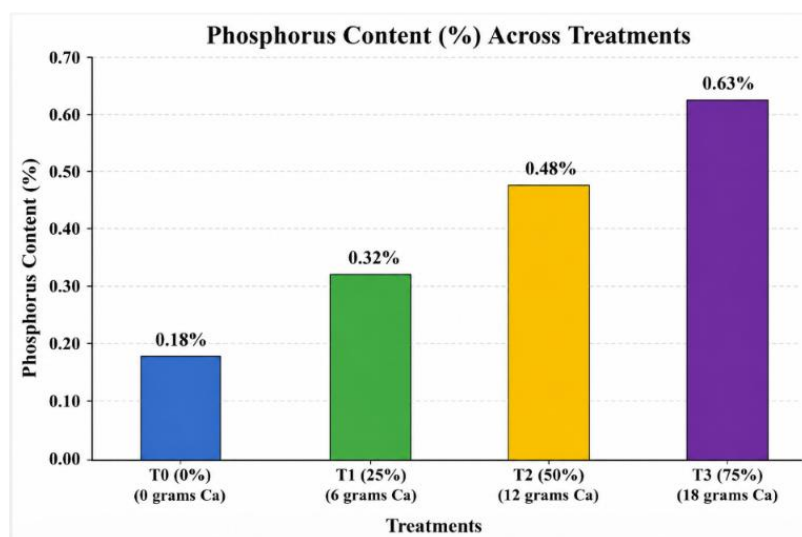


Figure 3. Phosphor content of pasta with addition of milkfish bone powder at four different concentrations.

3.2 Sensory Evaluation

Sensory evaluation was conducted among thirty (30) respondents composed of selected Hospitality Management food technology students and faculty/ teachers of the same institution. The responses were gathered using a structured sensory evaluation questionnaire based on a 5 Likert scale. The collected data were analyzed using the arithmetic mean to describe the sensory characteristics of each treatment. The study used Quantitative Description Analysis (QDA) score sheets, the milkfish bone powder treatment was evaluated according to the sensory attributes. The computed mean score was rounded off to determine the descriptive interpretation of each treatment. This presentation allows easy identification of similarities and differences among the three treatments.

Table 2

Presents the Average Mean and Descriptive Interpretation of the sensory characteristics of the milkfish bone powder

Quality Attributes	Treatment 1 (25%)	Descriptive Interpretation	Treatment 2 (50%)	Descriptive Interpretation	Treatment 3 (75%)	Descriptive Interpretation
Appearance	4.10	A Acceptable	4.35	VA Very acceptable	3.20	MA Moderately acceptable
Aroma	4.05	A Acceptable	4.40	VA Very acceptable	3.10	MA Moderately acceptable
Texture	3.95	A Acceptable	4.30	VA Very acceptable	3.05	MA Moderately acceptable
Taste	3.90	A Acceptable	4.25	VA Very acceptable	2.95	MA Moderately acceptable
Overall Acceptability	4.00	A Acceptable	4.33	VA Very acceptable	3.08	MA Moderately acceptable
Average Mean	4.00	A Acceptable	4.33	VA Very acceptable	3.08	MA Moderately acceptable

Results showed that Treatment 2 (50% milkfish bone powder) obtained the highest mean score of 4.33, which was interpreted as *Very Acceptable*. This treatment exhibited a balanced combination of appearance, aroma, texture, and taste. In comparison, Treatment 1 (25%) was rated as acceptable but was observed to be less tasteful, while

Treatment 3 (75%) demonstrated lower acceptability due to its stronger fish flavor and darker appearance.

Level of Acceptability - Based on the result Treatment 2 (50%) of added milkfish bone powder in pasta was identified the most preferred formulation among the three (3) treatments due to its balanced sensory characteristics. It achieved a desirable texture and flavor profile without producing an overpowering fish taste which contributed to its higher level of acceptability among respondents.

Significant Difference - ANOVA test results revealed that there is no significant difference among the treatments in appearance. However, significant differences were observed in aroma, texture, taste and overall acceptability at a 0.05 level of significance $p < .05$.

Rank Preference - In rank preference, the treatment 2 (50%) of concentrated milkfish bone powder was ranked first among the three treatments followed by treatment 1 (25%) while treatment 3 (75%) of concentrated milkfish bone powder was ranked last. These findings indicate that increasing the concentration of milkfish bone powder significantly affects the overall quality and sensory attributes of the product, confirming that the 50% formulation was the most favored among the respondents.

4. Conclusion

The incorporation of milkfish bone powder into pasta successfully enhanced its nutritional value, significantly in terms of calcium, phosphorus, protein, and mineral content, while also promoting the sustainable utilization of fishery by-products. Among the treatments tested, the 50% milkfish bone powder formulation emerged as the most acceptable in terms of appearance, aroma, texture, taste, and overall consumer preference. The findings demonstrate that milkfish bone powdered pasta is a promising functional food product that combines nutrition, sustainability, and sensory acceptability, offering an innovative and healthier alternative to conventional pasta products.

Practical Educational Implications - The findings of this study have important practical implications for food technology education, science instruction, and school-based sustainability programs. Since the study showed that milkfish bone powder can significantly improve the calcium, phosphorus, protein, and mineral content of pasta while maintaining acceptable sensory qualities, particularly at the 50% formulation, the product can be used as a concrete example of how classroom-based food innovation can address both nutrition and environmental sustainability. This makes the study relevant not only as a food product development project but also as an educational model for applying scientific knowledge to real-life community needs.

For teachers and practitioners, the study provides a practical instructional example that can be integrated into lessons on food technology, nutrition, entrepreneurship, environmental science, and research methods. Teachers may use the development of calcium-fortified pasta as a project-based learning activity where students investigate food fortification, conduct simple sensory evaluation, analyze nutritional improvement, and reflect on waste reduction. This type of activity can help students connect scientific concepts such as mineral content, food processing, proximate analysis, and consumer acceptability with everyday food choices and local resources.

For students, the study demonstrates how locally available materials, such as milkfish bones, can be transformed into useful and value-added products. This can strengthen students' creativity, problem-solving skills, environmental awareness, and appreciation of sustainable food systems. By participating in similar food innovation projects, students may better understand the importance of nutrition, especially calcium intake for bone health, while also learning that food waste can be converted into functional ingredients. Such learning experiences can encourage students to become more health-conscious, resourceful, and socially responsible.

For schools, the findings suggest that food innovation projects can support broader educational goals related to health promotion, sustainability, and community engagement. Schools offering hospitality management, food technology, home economics, livelihood education, or science-related programs may adopt similar product

development activities as part of laboratory work, research projects, or entrepreneurship training. The study also provides a possible model for school-community collaboration, particularly in areas where milkfish production is common and fish-processing by-products are readily available. Through this approach, schools can help promote local resource utilization, reduce waste, and encourage students to develop affordable and nutritious food products.

The study also has implications for school-based nutrition and feeding initiatives. Although further testing and product standardization are needed before large-scale implementation, the results suggest that calcium-fortified pasta may have potential as a nutritious alternative food product for learners, especially in contexts where calcium deficiency and limited access to nutrient-rich foods are concerns. The high acceptability of the 50% milkfish bone powder formulation indicates that nutrient enhancement can be achieved without seriously compromising taste, texture, aroma, and appearance. This is important because students are more likely to consume fortified foods when they remain familiar, affordable, and acceptable. Overall, the educational significance of the study lies in its demonstration that research, nutrition, sustainability, and entrepreneurship can be meaningfully combined in school settings. The findings encourage teachers, students, and schools to view food product development not merely as a technical activity, but as a practical educational strategy for promoting health, environmental responsibility, innovation, and community-based problem solving.

Declaration on the Use of Artificial Intelligence Tools - The authors declare that artificial intelligence-assisted tools were used only for language refinement, grammar checking, and improvement of the clarity and readability of the manuscript. The AI tool was not used to generate research data, conduct statistical analysis, interpret the findings independently, or replace the authors' scholarly judgment. All content, results, interpretations, and conclusions were carefully reviewed, verified, and approved by the authors. The authors take full responsibility for the accuracy, integrity, and originality of the final manuscript.

Author's Contribution: Joshua G. Gadiano- carried out the experiment and collected the data, helped supervise the project, and Elvira Shiey C. Correa- wrote the manuscript, verified theoretical and analytical methods and discussed the results and contributed to the final manuscript.

Conflict of Interest

The authors declare that they have no competing interests.

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Isang komprehensibong pagsusuri sa danas ng mga guro sa implementasyon ng MATATAG Curriculum

Abadiano, Anne Bernadette J. ✉

Leyte Normal University, Philippines (abadianoanne2001@gmail.com)

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Abstract

Sa paglipas ng panahon, patuloy na kinakaharap ng bansang Pilipinas ang iba't ibang suliranin sa larangan ng edukasyon partikular sa pagkatuto ng mga mag-aaral sa mga mahahalagang kasanayan bilang pundasyon ng kaalaman. Gayunpaman, sa kabila ng implementasyon ng MATATAG Curriculum, nananatili ang ilang hamon sa mga guro sa bansa. Layunin ng pag-aaral na ito na malaman ang mga hamon na nararanasan ng mga guro sa implementasyon ng MATATAG Curriculum. Ang pag-aaral na ito ay isang kwalitatibong pananaliksik na ginamitan ng pamaraang Husserlian deskriptibong penomenolohikal. Lumabas sa pagsusuri na ang hamon na naranasan ng mga kaguruan sa implementasyon ng MATATAG Curriculum ay kakulangan ng training, limitadong access sa *instructional materials*, limitadong oras sa paghahanda ng aralin, dagdag na *workload at administrative tasks*. Sa kabilang banda, natulasan sa pag-aaral na ang pagkakaroon ng kolaborasyon at *peer support, self-directed learning*, paglahok sa mga seminars/webinars, *self-motivation*, at pagkatuto ng mga mag-aaral ay ang mga mekanismo sa pagkaya ng mga guro upang malampasan ang mga hamon sa implementasyon ng MATATAG Curriculum. Bilang rekomendasyon, magbahagi ng mga *trainings/seminar/workshop na collaborative at reflective* sa bawat buwan, pagtaas ng pondo para sa sentralisado at organisadong pamamahagi ng mga *instructional materials*, pagbuo ng *sustainable* na sistema ng edukasyon at malawakang reporma sa ilang gawaing administratibo at *working hours* at pagkakaroon ng *teacher support staff system*.

Keywords: hamon, mekanismo ng pagkaya, MATATAG Curriculum

Isang komprehensibong pagsusuri sa danas ng mga guro sa implementasyon ng MATATAG Curriculum

1. Introduksyon

Ang edukasyon ay patuloy na nagbabago upang matugunan ang pangangailangan ng mga mag-aaral at ng lipunan. Bilang tugon sa mga hamon sa sistema ng edukasyon sa bansa, ipinakilala ng Kagawaran ng Edukasyon ang MATATAG Curriculum na naglalayong pagtuunan ng pansin ang mahahalagang kasanayan sa pagbasa, pagsulat, at pagbilang, gayundin ang pagpapalakas ng pundasyong akademiko ng mga mag-aaral. Isinasaad sa pangkalahatang layunin ng K-12 Curriculum ng Pilipinas ang paghubog ng mga mag-aaral na may sapat na kasanayan, kaalaman, at pagpapahalaga na kinakailangan upang maging handa sa mga hamon ng makabagong panahon. Gayunpaman, sa kabila ng implementasyon nito, nananatili ang ilang hamon sa kalidad ng edukasyon sa bansa, partikular sa kakayahan ng mga mag-aaral sa pagbasa, matematika, at agham. Kaugnay nito, inilunsad ng Kagawaran ng Edukasyon ang MATATAG Curriculum, na nangangahulugang *“MAke the curriculum relevant to produce job-ready, Active and responsible citizens. TAke steps to accelerate the delivery of basic education services and facilities. TAke good care of learners by promoting learner well-being, inclusiveness, and a positive learning environment. Give support for teachers to teach better”*, bilang isang reporma upang mapabuti ang sistema ng edukasyon sa Pilipinas.

Ang MATATAG Curriculum ay nakatuon sa pagpapagaan ng kurikulum, pagpapalakas ng pundasyong kasanayan tulad ng pagbasa at pagbilang, at pagbibigay-diin sa mahahalagang kompetensi na tunay na kailangan ng mga mag-aaral. Layunin din nitong tugunan ang mga natukoy na kakulangan sa kasalukuyang sistema ng edukasyon, kabilang ang sobrang dami ng learning competencies at limitadong oras ng pagtuturo. Ayon sa Kagawaran ng Edukasyon (DepEd, 2023), ang kurikulum na ito ay idinisenyo upang maging mas episyente, inklusibo, at tumutugon sa pangangailangan ng mga mag-aaral sa ika-21 siglo. Sa kontekstong ito, mahalagang isaalang-alang ang papel ng mga guro sa matagumpay na implementasyon ng MATATAG Curriculum. Ang mga guro ang pangunahing tagapagpatupad ng kurikulum, kaya’t ang kanilang saloobin, pananaw, at antas ng pagtanggap ay may malaking impluwensya sa bisa ng pagpapatupad nito. Ayon kay Fullan (2007), ang tagumpay ng anumang repormang pang-edukasyon ay nakasalalay sa aktibong partisipasyon at pagtanggap ng mga guro. Kung positibo ang kanilang saloobin, mas nagiging epektibo ang implementasyon ng kurikulum.

Dagdag pa rito, ipinakita nina Darling-Hammond, Hyler, at Gardner (2017) na ang patuloy na propesyonal na pag-unlad ng mga guro ay mahalaga upang mapabuti ang kanilang kakayahang umangkop sa mga pagbabago sa kurikulum. Sa kabilang banda, binigyang-diin nina Ornstein at Hunkins (2018) na ang kakulangan sa suporta, oras, at kagamitang panturo ay maaaring magdulot ng negatibong saloobin sa mga guro hinggil sa implementasyon ng mga reporma sa edukasyon. Samantala, ayon kay Bandura (1997), ang paniniwala ng mga guro sa kanilang sariling kakayahan o *self-efficacy* ay may malaking epekto sa kanilang pagtanggap sa mga pagbabago. Sinusuportahan ito ni Guskey (2002), na nagsasabing ang positibong karanasan at resulta sa pagtuturo ay nagpapataas ng kumpiyansa ng mga guro sa pagpapatupad ng mga bagong programa.

Ayon sa pag-aaral ni Lantaya (2025), bagama’t maraming guro ang may positibong saloobin at mataas na self-efficacy, natukoy ang mga hadlang gaya ng kakulangan sa instructional materials, sapat na pagsasanay, at mabigat na workload sa pagtuturo ng Home Economics sa ilalim ng MATATAG Curriculum. Sa pagdaragdag, mula sa pag-aaral nina Ta-Ala, Sullivan, at Martir (2025), mataas ang *attitude* at *commitment* ng mga lider sa paaralan, na maaaring maka-impluwensya rin sa saloobin ng mga guro. Bagama’t may mga hamon tulad ng pagbabalanse ng mga tungkulin at pamamahala, hindi nito nahadlangan ang maayos na pagpapatupad ng MATATAG Curriculum. Sa kabilang banda, ayon sa pag-aaral ni Demate et al. (2025), nakita na bagama’t itinuturing ng mga guro na malinaw at makabuluhan ang kurikulum, mas maraming hamon ang kinaharap ng mga guro sa pampublikong paaralan tulad ng labis na dami ng nilalaman ng kurikulum, mga hadlang na administratibo, at kakulangan sa mga

kagamitang panturo. At mabigat na trabaho, emosyonal na *stress* dulot ng kakulangan sa mga kagamitan, at ang pangangailangang magpatupad ng praktikal na hakbang.

Kaugnay nito, mula sa pag-aaral naman nina Saro et al. (2024), na isinagawa sa iba't ibang paaralan sa dibisyon ng Agusan del Sur nakita na ang MATATAG Curriculum bilang may malaking potensyal sa pagpapalawak ng kritikal na pag-iisip at kasanayan sa paglutas ng suliranin ng mga mag-aaral. Gayunpaman, ipinahayag na may pangamba hinggil sa pangangailangan ng mas malawak na propesyonal na paglinang at sapat na mga kagamitan upang maging matagumpay ang pagpapatupad ng mga bagong pamamaraan. Dagdag pa sa pag-aaral nina Kilag et al. (2024), natuklasan na ang mga pangunahing hamon ng mga gurong elementarya sa pagpapatupad ng MATATAG Curriculum ay ang kakulangan sa mga kagamitan at materyales, pagdami ng hinihingi ng kurikulum, at pangangailangan para sa mas pinaigting na propesyonal na paglinang at suporta. Inirekomenda sa mga kinauukulang awtoridad na maglaan ng sapat na kagamitan at materyales, bumuo ng mga programang pang-propesyonal na paglinang, at suportahan ang mga guro sa pamamagitan ng paglikha ng isang malikhaing at nakahihikayat na kapaligiran sa trabaho upang maging mas matagumpay na pagpapatupad ng MATATAG Curriculum (Wabingga et al., 2024).

Bagama't maraming pag-aaral na ang isinagawa hinggil sa implementasyon ng MATATAG Curriculum, karamihan sa mga ito ay nakatuon lamang sa mga pananaw, karanasan, at hamong kinakaraap ng mga guro sa pampublikong paaralan sa pagpapatupad nito. Dahil dito, mahalagang magsagawa pa ng mas masusing pag-aaral sa mga pampribadong paaralan sapagkat hindi ito napagtutuunan nang pansin at upang mapunan ang mga suliranin ng ito at higit na mapabuti ang implementasyon ng MATATAG Curriculum sa sistema ng edukasyon sa Pilipinas. Sa kabuuan, bibigyang-tuon ng mananaliksik ang pagtukoy sa mga karanasan partikular sa mga hamon at mekanismo ng pagkaya ng mga guro sa pampribadong paaralan sa implementasyon ng MATATAG Curriculum. Inaasahan na ang resulta ng pananaliksik na ito ay makapagbibigay ng mahalagang impormasyon sa mga tagapamahala ng edukasyon, mga guro, at iba pang stakeholder upang higit na mapabuti ang pagpapatupad ng kurikulum at matiyak ang kalidad ng edukasyon sa bansa. Bibigyang-pokus ng mananaliksik ang mga suliranin ng kinakaharap sa pagtuturo ng mga guro sa implementasyon ng MATATAG Curriculum.

Layunin ng Pag-aaral - Ang pag-aaral na ito ay naglalayong masuri ang iba't ibang karanasan ng mga guro sa implementasyon ng MATATAG Curriculum. Partikular, nilalayong matugunan ang sumusunod na tanong:

- Ano ang hamon ng mga guro sa implementasyon ng MATATAG Curriculum?
- Ano ang mekanismo ng pagkaya ng mga guro sa implementasyon ng MATATAG Curriculum?

Saligang Teoretikal - Ang pag-aaral na ito ay nakasalig sa mga teoryang *Coping Theory* ni Lazarus at Folkman, *Self-Determination Theory (SDT)* ni Ryan at Deci, at *Experiential Theory* ni David Kolb. Ayon sa *Coping Theory* (1984), ang *coping strategies* o mekanismo ng pagkaya ng bawat indibidwal; ay nakadepende sa maaaring mapagkunan at magagamit. Kinilala ni Lazarus ang *self-efficacy*, *optimism*, *hope*, at *resilience* bilang susi para sa mas mabuting pag-unawa sa kung paano umangkop ang isang indibidwal sa *stress*. Ito ay maiuugnay sa *Self-Determination Theory (SDT)* ni Ryan at Deci (2020), ang tao ay likas na may motibasyon upang umunlad at makamit ang kanyang mga layunin. Ang tatlong pangunahing pangangailangan na ito ay ang *autonomy* o control sa sariling desisyon, *competence* o kakayahan, at *relatedness* o pagkakaugnay na magsisilbing pundasyon ng motibasyon ng mga guro at mahalagang salik sa paraan ng paharap sa mga pagbabago at hamon sa larangan ng propesyon. Sa pagdaragdag, inilahad ng *Experiential Theory* ni David Kolb (Binanggit ni Cherry, 2020), ang kaalaman ay nalilintang sa pamamagitan ng karanasan na nagsisilbing batayan sa pagbuo ng *coping mechanism* ng indibidwal. Ang mga teoryang ito ay nagsisilbing gabay sa pagbuo ng pag-aaral na ito.

2. Metodolohiya

Ang pag-aaral na ito ay gumamit ng Husserlian deskriptibong penomenolohikal na disenyo ng pananaliksik. Ito ay isang pilosopikal na metodolohiya ng pananaliksik na naglalayong maunawaan ang *lived experience* ng mga

indibidwal na layunin nitong ibalik ang kahalagahan ng mundo ng tao bilang pundasyon g agham sa pamamagitan ng paglapit sa mga bagay o *the things themselves* (Christensen, Welch, at Barr, 2017).

Ang mga respondente sa pag-aaral na ito ay mga guro ng baitang 7 at 8 sa isa sa mga pampribadong paaralan ng bayan ng Palo, Leyte. Mayroong 10 na bilang ng mga respondente na pinili sa pamamagitan ng paggamit ng *purposive sampling* para sa pagkalap ng mga datos. Ayon kay Crossman (n.d.) ang *purposive sampling* ay isang posibilidad na *sample* na pinili batay sa mga layunin ng pag-aaral. Dagdag pa nito, ang *purposive sampling* ay kilala bilang *judgemental, selective, o subjective sampling*. Sa pananaliksik na ito, magsisilbing krayterya sa pagpili ng kalahok ang mga guro sa isa sa napiling pampribadong paaralan ng bayan ng Palo mula sa taong panuruan 2025-kasalukuyan, nagtuturo sa ilalim ng MATATAG Curriculum, at may kawilihan na maging kalahok ng pag-aaral.

Ang pag-aaral na ito ay gumamit ng *semi-structured* na talatanungan sa pangangalap ng datos. Ito ay sinuri ng tatlong (3) mga eksperto upang matiyak na magkakaroon ng katumpakan ang resulta ng isasagawang pag-aaral. Kinolekta naman ang mga datos noong ika-22 hanggang 24 ng Abril 2026. Matapos makuha ang mga datos sa isinagawang interview, mavalidate ang mga sagot ng mga kalahok, at malaman ang mga danas ng mga guro.

Ginamit ang Collaizi's *Seven Step of Data Analysis* (1978), ito ay nagbibigay ng masusi na pagsusuri sa bawat hakbang na nakakonekta sa mga datos na nakalap. Ginamit din ang *thematic analysis* upang maging balido ang mga datos. Matapos ma-validate ang mga datos ay nagsagawa ng *triangulation*, inihambing ang mga kasagutan ng iba't ibang kalahok, iniugnay ang mga datos sa literatura at iba pang sanggunian. Nang ma-finalize ang data, ibinalik ang datos sa kalahok, kung tama nga ba ang mga naitalang datos kung may nais silang ipabago o irekomenda. Sa ganitong paraan masasabing balido ang isinagawang pananaliksik sa tulong ng mga kalahok na ipakita sa kanila kung tama nga ba ang mga nakatala.

3. Resulta at Pagtalakay ng Pag-aaral

Ang bahaging ito ay presentasyon at interpretasyon ng mga datos na nakalap hinggil sa karanasan ng mga guro sa implementasyon ng MATATAG Curriculum batay sa isinagawang panayam.

3.1 Hamon ng mga Guro sa Implementasyon ng MATATAG Curriculum

Ang unang layunin ng pag-aaral na ito ay masuri ang mga hamon na kinakaharap ng mga guro sa implementasyon ng MATATAG Curriculum. Sa isinagawang pagsusuri lumabas ang sumusunod na tema batay sa kalagayan ng mga guro sa sa implementasyon ng MATATAG Curriculum.

Hamon ng mga Guro sa Implementasyon ng MATATAG Curriculum

(a) **Kakulangan ng Training.** Batay sa resulta ng isinagawang pakikipanayam sa mga kalahok, ang mga guro ay nakararanas ng suliranin sa implementasyon ng MATATAG Curriculum partikular sa kakulangan ng training. Ayon kay Kalahok 1:

“Isa sa mga pangunahing suliranin ay ang kakulangan ng sapat na oras para sa training bago ang mismong implementasyon ...” – Kalahok 1 – 04/24/26

Binanggit din ni Kalahok 2:

“Isa sa mga hamon ay ang kakulangan sa mga training. Kung mayroon man, ito ay kadalasang minamadali at hindi lubos na nagagamit.” – Kalahok 2 – 04/22/26

Sa pagpapatupad ng MATATAG Curriculum mahalagang bigyang-pansin ang kaalaman, kahandaan, at suporta sa mga guro bilang sila ang pangunahing tagapagpatupad ng pagbabago sa edukasyon. Isa sa pangunahing hamon na kinakaharap ay ang *insufficient professional development, rushed, at incomplete professional development* (Dadul et al., 2025). Karamihan ng mga guro ay nakaramdam ng kakulangan sa kahandaan, limitadong oras sa

training o pagsasanay, hindi sapat na oryentasyon, at kakulangan sa hands-on at praktikal na workshop (Dadul et al., 2025). Dahil dito, malinaw na may *implementation gap* sa pagitan ng inaasahang implementasyon at kakayahan ng guro sa pagpapatupad nito.

(b) **Limitadong Access sa Instructional Materials na nakabatay sa MATATAG Curriculum.** Ang limitadong *availability* ng mga *learning resources* o *instructional materials* tulad ng aklat, teknolohiya, *instructional materials*, at iba pang kagamitan upang maisakatuparan ang pag-implementa ng MATATAG Curriculum ay isa sa mga kritikal na suliranin na kinakaharap ng mga guro. Ayon pa sa paglalahad ni Kalahok 3:

“May mga pagkakataon ding kulang sa mga learning resources, kaya kinakailangan talagang maghanap ng mga online materials o kaya ay gumawa ng sariling learning materials.” – Kalahok 3 – 04/22/26

Binanggit din ng Kalahok 1, 2, 6, 7, 8, at 10:

“Dagdag pa rito ang kakulangan sa learning resources, na lalong nagpapahirap sa implementasyon ng bagong kurikulum.” – Kalahok 1,2,6,7,8,10 – 04/22/26

Ang pagkakaroon ng kakulangan sa mga kinakailangang kagamitan at materyales sa pagtuturo ay nagpapahirap sa mga guro na maihatid ang mga aralin at paksa na angkop sa layunin ng bagong kurikulum na nagresulta sa pagbaba ng kalidad ng edukasyon. Binanggit sa pag-aaral ni Fuentes (2025), napag-alaman na ang kakulangan sa sistematikong probisyon sa pagbuo ng mga *learning resources* at *instructional materials* ay nagreresulta sa paglipat ng responsibilidad sa mga guro. Sa ganitong kalagayan, napipilitan ang mga guro na bumuo ng sariling *learning resources* at *instructional materials* na nagdudulot ng karagdagang *workload* at gastos (Jalagat, Jr. & Aquino, Jr., 2022).

(c) **Limitadong Oras sa Paghahanda ng Aralin.** Isa ring suliranin na kinakaharap ng mga guro ay ang limitadong oras sa paghahanda ng kagamitang panturo at aralin na nakabatay sa MATATAG Curriculum dahil sa dami ng gawain at pangangailang dapat matugunan naging limitado ang pagbuo ng epektibong gawain. Batay sa naging resulta ng pakikipanayam ang karanasan sa pagharap ng hamong ito ay ayon kay Kalahok 7:

“Ilan sa mga hamon ay ang kakulangan ng sapat na oras para sa paghahanda ...” – Kalahok 7 – 04/21/26

Ang kakulangan sa paghahanda ng aralin ay nakaaapekto ng lubos sa mga guro at sa kalidad ng pagtuturo at pagkatuto ng mga mag-aaral. Ayon kina Bensuerto at Bernardino (2025), ang implementasyon ng kurikulum ay nahahadlangan ng mga isyu tulad ng limitadong *learning resources*, kakulangan ng sapat na oras sa paghahanda ng aralin, limitadong paggamit ng teknolohiya, at ang agarang pag-ayos ng pedagogy.

(d) **Dagdag na Workload at Administrative Tasks.** Lubos rin na nararanasan ng mga guro ang pagdami ng mga gawain at gawaing administratibo na nagpapakita ng malaking responsibilidad at pasanin tulad ng mga ulat at iba pang gawain. Ayon sa Organisation for Economic Co-operation and Development o OECD (2025), mula sa report ng TALIS (2024), ang mga guro ay nakararanas ng labis na administrative workload na nagdudulot ng *stress* at *time pressure*. Ayon pa sa paglalahad ni Kalahok 4:

“Kasabay nito ang pagdagdag ng mga paper works at ang muling paghahati o pag-aangkop ng mga kompetensi upang mas maunawaan ng mga mag-aaral.” – Kalahok 4 – 04/22/26

Binanggit rin ni Kalahok 1:

“Dagdag pa rito ang patuloy na bigat ng administrative workload na hindi maikakailang nakakaapekto sa oras na dapat sana ay para sa lesson preparation at aktwal na pagtuturo.” – Kalahok 1 – 04/24/26

Sa pagharap ng bagong kurikulum sa edukasyon ay dumami ang mga *non-teaching responsibilities* na nakaapekto sa oras ng mga guro para sa paghahanda ng aralin, kalidad ng pagtuturo, kalagayang emosyonal at sikolohikal (Malinao at Miano, 2025).

3.2 Mekanismo ng Pagkaya ng mga Guro sa Implementasyon ng MATATAG Curriculum

Ang pangalawang layunin ng pag-aaral na ito ay masuri ang mga ginagawang mekanismo sa pagkaya ng mga guro sa implementasyon ng MATATAG Curriculum. Ang sumusunod ay ang mga pamaraang ginagawa ng guro upang malampasan ang mga hamong hatid ng bagong kurikulum.

Mekanismo ng Pagkaya ng mga Guro sa Implementasyon ng MATATAG Curriculum

(a) **Kolaborasyon at Peer Support.** Batay sa resulta ng isinagawang pakikipanayam sa mga kalahok, ang mga mekanismo ng pagkaya ng mga guro sa implementasyon ng MATATAG Curriculum ay ang kolaborasyon sa kapwa guro. Binanggit ni Kalahok 1:

“Mahalaga rin ang pakikipag-collaborate sa kapwa guro dahil sa pagbabahagi ng karanasan, lesson plans, at teaching strategies na mas pinadadali ang pagharap sa mga hamon ng implementasyon.” – Kalahok 1 – 04/24/26

Binanggit din ni Kalahok 2:

“Ang mga estratehiyang aking ginagamit upang makaangkop sa bagong kurikulum ay ang pakikipag-ugnayan sa ibang guro upang magbahagi ng mga ideya, resources, at best practices.”
– Kalahok 2 – 04/22/26

Ang isa sa pangunahing paraan sa mekanismo sa pagkaya ay ang matinding suporta ng mga taong nakapaligid at pakikipagtulungan sa mga propesyonal (R. Pacatang & Gallardo, 2025). Sa pagdaragdag, ang pagtutulungan ng mga guro ay nagbibigay ng propesyonal at emosyonal na suporta habang hinaharap ang iba’t ibang *pressure* mula sa pag-angkop ng bagong *pedagogical framework* hanggang sa pamamahala sa mga kagamitan at resources (Wabingga at Tomakin, 2024). Ang *peer network* ay may mahalagang tungkulin lalo na kapag ang institusyonal na suporta sa *professional development system* ay kulang (Fuentes, 2025).

(b) **Self-Directed Learning.** Sa konteksto ng patuloy na pagbabago sa kurikulum, ang kakayahan ng guro na makaangkop sa mga bagong pangangailangan sa pagtuturo ay kinakailangan kaya naman ang isa sa mekanismo ng pagkaya ng mga guro ay ang Self-Directed Learning o ang sariling pagkatuto ng isang indibidwal. Nabahagi ng sumusunod na Kalahok 3, 5, 6, 8, at 9:

“Nagsasagawa rin ako ng pananaliksik at inaangkop ang mga best practices upang mas mapabuti ang pagtuturo.” – Kalahok – 04/22/26

Binanggit naman ni Kalahok 1:

“Malaki rin ang naitutulong ng panonood ng mga teaching demonstrations sa YouTube dahil dito ko nakikita kung paano isinasagawa sa aktwal na klase ang mga estratehiyang tinatalakay sa training.” – Kalahok 1 – 04/24/26

Sa pamamagitan ng Self-Directed Learning nagiging mas handa ang mga guro sa patuloy na paglinang ng kaalaman at kasanayan upang mapabuti ang kalidad ng edukasyon at maibahagi sa mga mag-aaral ng epektibo ang mga aralin. Ito ay kadalasang gumagamit ng mga *free online resources* o teknolohiya para masolusyonan ang gap sa pagkatuto at makahanap ng paraan upang maibahagi ang kurikulum (Pacatang & Gallardo, 2025).

(c) **Paglahok sa mga Seminars/Webinars.** Ang paglahok sa mga seminars/webinars ay isa sa mga mekanismo ng pagkaya ng mga guro upang maimplemeta nang mahusay ang MATATAG Curriculum dahil sa tulong nito

nadaragdagan ang kaalaman at kakayahan ng guro sa pagbabagong dulot ng kurikulum. Ayon pa sa paglalahad ni Kalahok 1, 2, 7, at 8:

“Aktibo akong nakikinig sa mga webinars at mga online teacher discussions upang manatiling updated sa mga bagong estratehiya at direksyon ng pagtuturo.” – Kalahok – 04/22/26

Binanggit ni Kalahok 5:

“Una, malaking tulong ang mga seminar-workshop tulad ng ginanap sa Borongan at Holy Infant na isinasagawa nang face-to-face. Bukod dito, kinakailangan din ang pagdalo sa kahit isang webinar kada buwan.” – Kalahok 5 – 04/22/26

Ayon sa mga pag-aaral, ang tuloy-tuloy na pagsasanay tulad ng seminar ay nagpapabuti sa mga kakayahan sa pagtuturo ng mga guro at naglalayon rin itong mapataas ang *resilience* ng mga guro (Singh at Sajitha, 2022). Sa karagdagan, ang mga guro na regular na nakikisangkot sa mga *professional development activities* ay mas handa upang harapin ang mga isyu sa silid-aralan at umangkop sa mga kailangan ng MATATAG Curriculum.

(d) **Self Motivation.** Ang pagkakaroon ng matibay na panloob ay nakatutulong lalo na sa mga pagbabago sa kurikulum at dagdag pa ang mga bagong gawain na kailangang tapusin ng mga guro. Sa kabila ng hirap, patuloy na ipinapakita ng mga pag-aaral na ang mga guro na nananatiling may positibong pananaw ay kayang malampasan ang mga kabiguan, manatiling *motivated*, at patuloy na magpabuti (Robinson et al., 2021). Nabanggit nina Kalahok 2:

“Palagi ko ring ipinapaalala sa aking sarili na ang pagtuturo ay isang habambuhay na proseso ng pagkatuto.” – Kalahok 2 – 04/22/26

Binanggit din ni Kalahok 8:

“Pinaaalalahan ko ang aking sarili na ang curriculum ay instrument lamang, ang puso ng edukasyon ay nasa ugnayan ng guro at estudyante, ang pagyakap sa pagbabago ay bahagi ng aking tungkulin bilang isang lifelong learner.” – Kalahok 8 – 04/22/26

Ang pagkakaroon ng mataas na tiwala o kumpanyansa sa sarili ay nagbibigay-daan sa mga guro na maiwasan ang pagdududa sa sarili at mga negatibong kaisipan. Nang dahil sa mas malaking kumpanyansa sa sarili, mas handang harapin nang guro ang hamong kinakaharap. Ang teorya nina Ryan at Deci na *Seld-Determination Theory (SDT)* ay nakatuon sa kung paano sinusuportahan o pinipigilan ng mga salik na panlipunang konteksto ang pag-unlad ng tao sa pamamagitan ng pagtugon sa kanilang sikolohikal na pangangailangan.

(e) **Pagkatuto ng mga Mag-aaral.** Sa kabila ng mga hamon tulad ng kakulangan ng training, limitadong access sa instructional materials, limitadong oras sa paghahanda ng aralin, dagdag na workload at administrative tasks patuloy pa rin na nagsusumikap ang mga guro, nananatiling mahalagang salik ang tagumpay ng mag-aaral bilang pangunahing pinagmumulan ng motibasyon ng mga guro (Ryan at Deci, 2000). Nabanggit ng lahat ng kalahok:

“Sa kabila ng pagod, stress, at sunod-sunod na pagbabago sa kurikulum, ang simpleng tagpo na may batang unti-unting natutong bumasa, nakakaintindi ng aralin, o nagkakaroon ng kumpiyansa sa sarili ay sapat na upang maramdaman kong may saysay ang lahat ng aking sakripisyo sa araw-araw na pagtuturo.” – Kalahok – 04/22/26

4. Konklusyon at Rekomendasyon

Konklusyon - Batay sa mga nakalap na datos, nabuo ang sumusunod na konklusyon: (1) Ang mga hamon na naranasan ng mga kaguruan sa implementasyon ng MATATAG Curriculum ay kakulangan ng training, limitadong access sa *instructional materials*, limitadong oras sa paghahanda ng aralin, dagdag na *workload* at *administrative*

tasks. Sa kabilang banda, (2) ang pagkakaroon ng kolaborasyon at *peer support*, *self-directed learning*, paglahok sa mga seminars/webinars, *self motivation*, at pagkatuto ng mga mag-aaral ay ang mga mekanismo sa pagkaya upang malampasan ang mga hamon sa implementasyon ng MATATAG Curriculum.

Rekomendasyon - Batay sa resulta at konklusyon ng pag-aaral, iminumungkahi ng mananaliksik ang sumusunod: Una, ang Departamento ng Edukasyon at Private Sectors sa larangan ng edukasyon ay kailangan na magtulungan at magbahagi ng mga trainings/seminar/workshop na *collaborative at reflective* sa bawat buwan upang malalimang maunawaan at maikintal sa mga guro ang layunin ng MATATAG Curriculum partikular sa pagpapahusay ng aktwal na pagtuturo at pagkatuto ng mag-aaral. Ikalawa, magkaroon ng sentralisado at organisadong pamamahagi ng mga *instructional materials* kay naman kinakailangan na maglaan ang pamahalaan ng malaking pondo upang lahat ng paaralan ay makatanggap. Pangatlo, pagbuo ng sustainable na sistema ng edukasyon at malawakang reporma sa ilang gawaing administratibo at *working hours* upang mas makapagpokus ang mga guro sa pagtuturo at pagkakaroon ng *teacher support staff system*.

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The A.I. KID study: Evaluating artificial intelligence interactivity and vocabulary acquisition in pre-kindergarten learners

Juan, Leandel U. ✉

Leyte Normal University, Philippines (2100962@lnu.edu.ph)



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Abstract

This study evaluated the effectiveness of AI-assisted interactive applications on vocabulary acquisition among Pre-K children in Tacloban City, Philippines, using a quasi-experimental two-group pretest–posttest design. Vocabulary depth was measured using the Vocabulary Knowledge Scale (VKS; Wesche & Paribakht, 1996) among ($n = 15$) children in a morning class (Experimental Group) receiving ten (10) sessions of AI through the Buddy.ai, Google Read Along, and Readability apps, and ($n = 15$) children in an afternoon class (Control Group) receiving standard Pre-K instruction over the same two weeks. Both groups had Pre-emergent baseline VKS scores (Experimental: $M = 13.00$, $SD = 1.69$; Control: $M = 12.93$, $SD = 1.28$), confirming pre-intervention equivalency. Paired-sample t -tests confirmed significant within-group gains: the Experimental Group experienced a mean gain of 18.60 points (posttest $M = 31.60$; Cohen's $d = 3.18$), with most students advancing to Developing and Proficient levels on the VKS, while the Control Group's mean gain of 2.00 points (posttest $M = 14.93$; $d = 0.37$) left no Control Group students advancing from the Pre-emergent stage. Posttest between-group comparison yielded $t(28) = 14.87$, $p < .001$, $d = 5.43$, confirming highly significant differences in vocabulary development outcomes between the two groups due to AI-assisted intervention. Therefore, the null hypothesis was rejected. These results provide strong quasi-experimental evidence that teacher-mediated structured AI applications provided significantly greater vocabulary development for Pre-K children in Tacloban City, Philippines than did the traditional instructional approach alone.

Keywords: artificial intelligence, Buddy.ai, early childhood education, Google Read Along, Philippines, pre-kindergarten, quasi-experimental, readability, vocabulary acquisition, Vocabulary Knowledge Scale

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1. Introduction

The rapid growth of digital technology in early childhood education settings has made artificial intelligence (AI) an increasingly viable instructional strategy for young language learners. In the Philippines, children aged four to five are increasingly exposed to digital devices before entering school, although the majority of these experiences has been passive in nature (e.g., watching animated videos; listening to narrated stories, or tapping a screen to play a game). There is increasing evidence linking passive engagement to limited gains in expressive vocabulary development, reduced ability to engage in depth of conversation, and a lack of growth in reading readiness skills (Chaudron & Di Gioia, 2024). As such, the A.I. KID Study emerged as a direct challenge to this model by investigating whether teacher-guided interaction with AI applications would lead to an increase in vocabulary acquisition among Pre-Kindergarten students in Tacloban City.

The global literacy landscape is dire. According to The World Economic Forum (2024), hundreds of millions of school-aged children around the world do not have the ability to read a simple sentence when they complete primary school. The Programme for International Student Assessment (PISA) scores show a large difference in reading skills for 15 year olds in the Philippines based on PISA's 2022 assessments. This supports evidence that there are some systemic issues (that started with preschool) that are impacting children's literacy skills. Children in the Pre-Kindergarten years (ages approximately 3 - 5) have an excellent opportunity for developing their language skills because, at this age, there is a maximum amount of ability for developing the associated neural pathways used for phonological awareness, semantic memory and syntactic processing (Vygotsky, 1978). Therefore, any efforts made to address literacy acquisition during this time period will yield disproportionate gains in terms of future literacy achievement.

Conversational AI tools developed specifically for young children provide a unique opportunity to assist with closing this achievement gap. Applications such as Buddy.ai, Google Read Along, and Readability provide a gamified, child-friendly environment in which children are not merely observing what happens but actively participating by speaking, responding, and demonstrating comprehension in real time. Furthermore, these platforms are unlike traditional modes of instructional media in that they are able to adapt to the pace of each individual child and provide immediate, corrective feedback while sustaining interest through active participation. Research further suggests that low-anxiety, gamified AI environments promote verbal risk-taking among young learners, leading to increased language production (Hidayat, 2024). UNESCO (2024) is encouraging teachers to assume a digital mentoring role to provide secure, ethical, and pedagogically relevant means of exploring the transformational possibilities of generative AI in early education.

In February 2025, the Department of Education (DepEd) institutionalized the use of AI-assisted education in the Philippines with the opening of the Education Center for AI Research (E-CAIR) by officially incorporating tools such as Buddy.ai and Google Read Along into the basic education system. Based on the findings of Acuña (2025), Filipino children who have utilized gamified AI tools to support their literacy development have shown noticeable improvement in motivation as well as production of language when compared to children instructed through traditional means.

Although the body of evidence supporting the use of AI for learning in primary and secondary schools continues to grow, there is still a significant gap in the empirical literature regarding the use of AI to teach children at the pre-kindergarten level in Tacloban City. There have only been two studies that employed standardized psycholinguistic measures (such as the Vocabulary Knowledge Scale; Wesche & Paribakht, 1996) to measure depth of vocabulary for very young Filipino children. This study aims to fill that gap by attempting to examine if the use

of structured incentives (AI) with a 'teacher as facilitator' results in statistically significantly and practically meaningfully increased vocabulary acquisition in pre-kindergarten children, using an experimental design - two groups (experimental and control) will have a pre-test (before) and post-test (after) for measurement of vocabulary acquisition.

On the Philippine context, two studies have been conducted recently that relate to this topic. Candilas (2025) performed a thematic synthesis of AI applications/uses in language education. Elepaño (2024) studied the effects of gamification upon student performance. Both studies lend some support for increasing technological assistance in the instruction of students in Philippine classrooms; however, neither has focused specifically upon the pre-kindergarten level or have used the Vocabulary Knowledge Scale to evaluate depth of vocabulary. Consequently, there exists a gap in the literature which this study will address.

Objectives of the Study - This study aimed to evaluate the effectiveness of interactive AI technologies at improving the vocabulary skills of Pre-K students in Tacloban City, Philippines. Specifically, this study investigated: (1) the amount of vocabulary that each group had acquired before the intervention; (2) the amount of vocabulary that each group had acquired following the intervention; and (3) whether there was a statistically significant difference in the degree to which each group improved their respective vocabulary skills after the intervention.

Null Hypothesis (H_0) - There is no significant difference in the posttest vocabulary acquisition scores between the Experimental Group and the Control Group of Pre-Kindergarten learners after the utilization of interactive AI applications.

2. Methods

Research Design - A quasi-experimental two-group pretest–posttest design was used in this study. A quasi-experimental design is appropriate when it is not possible to use random assignment due to practical, ethical, or institutional reasons; however, the researcher wishes to provide evidence of comparative causation between the two groups using a non-equivalent control group (Field, 2018). To this end, two intact Pre-Kindergarten class sections—the morning section and the afternoon section—served as the Experimental group ($n = 15$) and the Control group ($n = 15$), respectively. During the same two-week period, both groups received conventional Pre-Kindergarten instruction, and the Experimental Group received a ten-session teacher-mediated AI-assisted vocabulary intervention. Both groups were pre-tested and post-tested using the VKS; the near-identical baseline VKS profiles of both groups confirmed equivalence and validity, providing the empirical foundation for valid between-group comparisons.

The design the researcher selected was a concurrent control group because it optimizes internal validity compared to the pre-experimental one group design; thus, any differences in outcomes between the two groups will be less likely attributed to maturation, incidental language exposure or pre-existing familiarity with the English measurement tool than to the effects of the intervention itself. The researcher understands that using intact class sections will limit somewhat the extent to which selection bias can be completely removed; however, the equivalency of pre-test scores and the degree of instructional condition consistency associated with each group significantly reduce the potential effects of this limitation.

Participants - The sample included Pre-K pupils from an early childhood centre located in Tacloban City, Leyte, Philippines during Academic Year 2025–2026. The sample consisted of 30 Pre-K pupils in total (Experimental Group: 15 morning; Control Group: 15 afternoon), ages 3 years and 6 months to 5 years and 11 months. Participants were selected using purposive sampling based on the following inclusion criteria: enrollment in the Pre-Kindergarten program, completion of the pretest, written parental consent, willingness to participate in digital device-related activities, and no current enrollment in Speech-Language Therapy or any other specialized language intervention. Written informed parental consent and child assent were obtained prior to data collection, in compliance with Leyte Normal University ethical standards and Republic Act No. 10173, also known as the

Instrument - The Vocabulary Knowledge Scale (VKS), a five-level incremental vocabulary assessment tool developed by Wesche and Paribakht (1996), was employed to determine vocabulary depth for two test occasions on 10 target vocabulary words: *curious, enormous, patient, furious, brave, gentle, gloomy, cozy, clever, and graceful*. The minimum possible score is 10 and the maximum is 50. The VKS has been recognized as a valid instrument for measuring incremental word knowledge in both first- and second-language contexts (Hadley & Dickinson, 2018). Recent systematic review literature has further provided evidence supporting its validity for indicating vocabulary depth in language learners (Zeng et al., 2025).

Intervention - The program used three different software programs or platforms in the following sequence: 1. Buddy.ai (Version 4.12) for vocabulary activation (approximately eight minutes). 2. Google Read Along (Version 1.64) for guided oral reading (approximately 14 minutes). And 3. Readability for consolidation of comprehension (approximately eight minutes). The 20-20-20 Protocol for eye health was utilized at the midpoint (15 minutes) of the session. The classroom teacher served as the facilitator of the program and provided culturally responsive activities for follow up to student responses generated by the Artificial Intelligence. The control group received instruction from a traditional curriculum and was not provided access to any of the three platforms during the study.

Theoretical Framework - There are four complementary theoretical approaches that serve as the foundation for this theoretical architecture: Mayer's Cognitive Theory of Multimedia Learning (2001), Paivio's Dual Coding Theory (1971), Sweller's Cognitive Load Theory (1988), and Vygotsky's Sociocultural Theory of Cognitive Development (1978). These four theories work together to illustrate how using structured, scaffolded, multimedia artificial intelligence (AI) interaction within the Zone of Proximal Development (ZPD) will produce meaningful vocabulary growth for young children.

Data Analysis - Descriptive statistics of pretest and posttest data were calculated for both groups. For the null hypothesis, three inferential analyses were conducted: paired-sample *t*-tests for each group to compare within-group results, and an independent-samples *t*-test to compare between-group posttest results. Normality was assessed using the Shapiro-Wilk test, and the assumption of homogeneity of variance was checked using Levene's test. Effect size was measured using Cohen's *d* (Cohen, 1988). All analyses were completed using IBM SPSS Statistics, version 28, at $\alpha = .05$, two-tailed.

3. Results and Discussion

3.1 Pretest Vocabulary Profiles: Experimental and Control Groups

Table 1

Pretest VKS Scores of the Experimental Group and Control Group (N = 15 per group)

VKS Score Descriptor	Range	Exp. f	Exp. %	Ctrl. f	Ctrl. %	Interpretation
Pre-emergent	10–18	15	100.0%	15	100.0%	No/minimal word knowledge
Emerging	19–26	0	0.0%	0	0.0%	Recognizes words; limited meaning
Developing	27–34	0	0.0%	0	0.0%	Functional understanding
Proficient	35–42	0	0.0%	0	0.0%	Uses words in context
Advanced	43–50	0	0.0%	0	0.0%	Full mastery
Mean (SD)	–	13.00 (SD = 1.69)	12.93 (SD = 1.28)			Pre-emergent (both)

Note. VKS = Vocabulary Knowledge Scale (Wesche & Paribakht, 1996). *Exp.* = Experimental Group (morning class, $n = 15$); *Ctrl.* = Control Group (afternoon class, $n = 15$). Scores range from 10 to 50. *f* = frequency; % = percentage within group. *SD* = standard deviation.

Table 1 shows the VKS pretest scores of both groups prior to the intervention. The Experimental Group had a

pretest mean of 13.00 ($SD = 1.69$) and the Control Group had a pretest mean of 12.93 ($SD = 1.28$). All 30 participants across both groups scored within the Pre-emergent range (10–18), indicating no prior knowledge of the 10 target vocabulary words. The near-identical pretest means confirm baseline equivalency between the groups, which is a critical prerequisite for valid quasi-experimental comparison. This Pre-emergent profile is consistent with the developmental patterns observed among Pre-Kindergarten children in the Philippines, where early vocabulary exposure has been predominantly passive in nature (Chaudron & Di Gioia, 2024).

3.2 Posttest Vocabulary Profiles: Experimental and Control Groups

Table 2

Posttest VKS Scores of the Experimental Group and Control Group (N = 15 per group)

VKS Score Descriptor	Range	Exp. f	Exp. %	Ctrl. f	Ctrl. %	Interpretation
Pre-emergent	10–18	0	0.0%	15	100.0%	No/minimal word knowledge
Emerging	19–26	0	0.0%	0	0.0%	Recognizes words; limited meaning
Developing	27–34	12	80.0%	0	0.0%	Functional understanding
Proficient	35–42	3	20.0%	0	0.0%	Uses words in context
Advanced	43–50	0	0.0%	0	0.0%	Full mastery
Mean (SD)	–	31.60 ($SD = 2.87$)	14.93 ($SD = 1.28$)			Developing vs. Pre-emergent

Note. VKS = Vocabulary Knowledge Scale (Wesche & Paribakht, 1996). *Exp.* = Experimental Group (morning class, $n = 15$); *Ctrl.* = Control Group (afternoon class, $n = 15$). Posttest administered within one week of the final session using randomized word order.

Table 2 shows a significant difference between both groups in the post-test results. The mean Post-Test score for the Experimental group was 31.60 ($SD = 2.87$) representing an 18.60 point gain from Baseline. Out of the total 15 children in the Experimental group at the time of the post-test, 12 (80%) had progressed to the Developing level, and 3 (20%) had progressed to the Proficient level. The Control group had a mean Post-Test score of 14.93 ($SD = 1.28$) with only a 2.00 point gain from Baseline and no children progressed to beyond the Pre-emergent level at the time of the post-test. Qualitative analysis of the session logs showed that children in the Experimental Group spontaneously began producing some of the target vocabulary words (e.g., gentle, gloomy, and cozy) without prompting within 2 weeks of the introduction of those words, while this was not the case in the Control Group. The data provide additional evidence that vocabulary development was determined by the use of AI-mediated interactivity, rather than through incidental exposure to vocabulary in a classroom setting.

3.3 Inferential Analysis: Within-Group and Between-Group Comparisons

Table 3

Within-Group Paired-Sample t-Test Results and Between-Group Independent-Samples t-Test (N = 15 per group)

Comparison	Mean Diff.	<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>
Experimental Group: Pre vs. Post (Paired t-test)	18.60	22.14	14	< .001	3.18
Control Group: Pre vs. Post (Paired t-test)	2.00	2.31	14	.037	0.37
Between Groups: Experimental vs. Control Posttest (Independent t-test)	16.67	14.87	28	< .001	5.43

Note. Paired-sample *t*-tests used for within-group comparisons. Independent-samples *t*-test used for between-group posttest comparison. The independent samples *T* test for Experimental Group ($M = 31.60$) and Control Group ($M = 14.93$) indicates an unusually large effect size ($t(28) = 14.87$, $p < .001$, $d = 5.43$), thereby providing convincing evidence that a highly significant difference existed in vocabulary acquisition between the two groups.

This means that vocabulary acquisition of the Experimental Group utilizing AI-assisted instruction had an unusually high level of success compared to the Control Group; therefore, the null hypothesis was rejected. These results support the theoretical framework of the study. The vocabulary gains of the Experimental Group are consistent with Mayer's (2001) dual-channel multimedia engagement, Paivio's (1971) dual encoding of verbal and

imagistic memory traces, Sweller's (1988) management of cognitive load through scaffolding, and Vygotsky's (1978) mediated scaffolding within each child's Zone of Proximal Development. Evidence is also provided by Nguyen and Zisook (2025), who showed that vocabulary acquisition increases rapidly for emerging readers who receive timely, accurate feedback from an AI tutoring system. The immediate feedback loops afforded by Google Read Along's real-time corrective feedback and Buddy.ai's adaptive conversational scaffolding induced accelerated vocabulary acquisition for the Experimental Group in this study.

4. Conclusion

The research comprised a quasi-experimental two-group pretest–posttest methodology that aimed to ascertain the degree to which structured, teacher-facilitated AI-supported instruction provides an avenue for improved vocabulary acquisition for Pre-Kindergarten children in Tacloban City. Both groups demonstrated similar Pre-emergent VKS profiles (Experimental: $M = 13.00$; Control: $M = 12.93$) prior to the study. During the two weeks of intervention, the Experimental Group had a significantly greater increase in vocabulary ($M = 31.60$, $d = 3.18$) than the Control Group ($M = 14.93$, $d = .37$). A comparison of the two groups confirmed that the Experimental Group had a significantly greater increase in vocabulary than the Control Group ($t(28) = 14.87$, $p < 0.001$, $d = 5.43$), thus rejecting the null hypothesis. The results of the A.I. KID Study provide strong evidence from a quasi-experimental study demonstrating that Pre-Kindergarten students who received structured and teacher-facilitated interactions with the use of Buddy.ai, Google Read Along and Readability, made significantly greater gains in vocabulary after two weeks than those who only received traditional instruction. These findings also support the use of AI tools as evidence-based resources in the implementation of basic education in the Philippines, consistent with the Department of Education's E-CAIR Initiative.

Practical Educational Implications - The results of the AI KIDS Study provide valuable insights for practitioners (teachers), students, and schools within the context of the Philippines' educational system.

For **teachers**, according to the research, teachers can achieve large vocabulary gains by injecting a structured three-platform A.I. learning session into their daily Pre-Kindergarten literacy program —along with a 20-20-20 eye health protocol — in as little as two weeks, even without having expertise with A.I., when acting as a culturally responsive facilitator in conjunction with A.I. tools. It is recommended that teachers should receive professional development in digital mentoring to support effective A.I. implementation, as is supported by UNESCO (2024).

For **students**, the finding of this study indicates that, for students, interactive A.I. learning environments access to responsive, gamified A.I. applications may accelerate vocabulary acquisition and reading readiness for Pre-Kindergarten students who, prior to school, have primarily been exposed to passive digital content. Furthermore, they can aid in the development of vocabulary depth and reading readiness during the critical window of opportunity identified by Vygotsky (1978).

For **schools and administrators**, the findings of the study provide schools and administrators with evidence of the effectiveness of implementing AI-assisted vocabulary instruction for all Pre-Kindergarten students in the context of the DepEd's E-CAIR initiative. Schools are encouraged to routinely invest in age-appropriate A.I. platforms for early childhood education and to establish policies for responsible and supervised A.I. usage in early childhood settings.

Limitations - One of the major limitations of this research is that the participants were not randomly assigned to groups—intact classes were used. The research was carried out in a single private school located in Tacloban City, limiting generalizability of the findings. The intervention period was only two weeks, and there was no delayed retention test; and three separate AI applications were evaluated concurrently, making it impossible to determine the independent contribution of each application to the outcome measures.

Recommendations - Future researchers are encouraged to repeat this study using true experimental, delay post-test, and that include multiple public and multi-language settings, in addition to using independent blind raters,

and also apply component analysis designs and mixed methods approaches, in order to isolate the effects of each AI tool.

AI Use Disclosure - Claude (Anthropic, version claude-sonnet-4-20250514; 2025) was used as a language editing and formatting tool for my/our manuscript. All outputs were verified, reviewed, and edited by the author/s to ensure fact-checking, statistical validity, and citation accuracy. No personal or identifying information was submitted to AI. The author/s assume sole responsibility for this work..

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Disaster risk reduction management readiness level in flood-prone municipalities of Camarines Sur

Herrera, Monica L. ✉

Central Bicol State University of Agriculture, Philippines (monica.h3r@gmail.com)

Alimango, Carl C.

Salvadora, Mariz C.

Borromeo, Rosemarie Joy M.

Moron, Bernyl M.

Nolasco, Michael N.



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Abstract

This study aimed to assess DRRM readiness levels among staff in the flood-prone municipalities of Milaor, San Fernando, and Pasacao, Camarines Sur. Random sampling selected participants from each municipality's DRRM workforce to ensure representative data on key components: hazard assessment, early warning systems, emergency response planning, infrastructure preparedness, and community capacity building. Data collection involved survey questionnaires distributed to randomly sampled DRRM staff, supplemented by survey. Analysis followed the NDRRMC Readiness Assessment Framework, with results interpreted using standards from the Philippine DRRM Act of 2010 (RA 10121) and its implementing rules. Survey findings showed staff reported compliance with minimum standards for hazard mapping and early warning systems in most areas. However, emergency shelter capacity and evacuation route signage consistently failed to meet requirements across all three municipalities. Responses also revealed that community awareness and training programs were below recommended levels, indicating weak grassroots preparedness. Logistics coordination for relief operations was inadequate in inland areas. Based on NDRRMC guidelines, Milaor, San Fernando, and Pasacao were classified as having "high level readiness" suitable for common flood events. Yet, improvements are needed to handle severe or complex disasters. These results emphasize the need for greater investment in infrastructure, regular readiness audits, and targeted capacity-building programs for DRRM staff. Strengthening these areas will improve flood resilience in the surveyed municipalities. The study provides baseline data for local government units and policymakers to prioritize resource allocation and address gaps in emergency shelter, signage, training, and logistics coordination.

Keywords: readiness, demographic profile, correlation, training facilities, equipment and human resources

Disaster risk reduction management readiness level in flood-prone municipalities of Camarines Sur

1. Introduction

The Philippines is highly vulnerable to floods, ranking among the top disaster-prone countries globally (World Risk Report, 2023). The country experiences frequent flooding, especially in low-lying areas like Camarines Sur, due to its geographical location and climate. The Philippine government has institutionalized the Disaster Risk Reduction and Management Act of 2010 (RA 10121) to enhance community resilience. Camarines Sur, particularly municipalities like Milaor, San Fernando, and Pasacao, face recurring flood events that disrupt socio-economic activities and endanger lives. Effective DRRM is crucial, but readiness varies across Local Government Units (LGUs) due to limited resources and inadequate infrastructure. This study assesses DRRM readiness in these flood-prone municipalities, focusing on operational readiness, resource capacity, and community engagement. It aligns with Sustainable Development Goals (SDGs) 1, 3, 9, 11, and 13, contributing to poverty reduction, health outcomes, and climate action. Previous studies highlight the importance of localized DRRM planning, community-based knowledge, and early warning systems in reducing flood impacts (Ignacio and Mercado, 2014; Lagmay et al., 2015). This research aims to identify gaps and provide recommendations to enhance flood risk management and inform policies for disaster risk reduction.

Objectives - The primary objective of this study is to assess the Disaster Risk Reduction and Management (DRRM) readiness of Milaor, San Fernando, and Pasacao in Camarines Sur, focusing on flood-prone areas. It seeks to profile respondents by age, civil status, education, and years of stay, and evaluate DRRM readiness in terms of training, equipment, and human resources. The study also examines the relationship between respondent profiles and DRRM readiness, aiming to propose interventions and enhance disaster resilience in these municipalities.

Significance of the study - This study evaluates the Disaster Risk Reduction and Management (DRRM) readiness of flood-prone municipalities in Camarines Sur, Philippines, with the aim of enhancing local disaster preparedness and resilience. Specifically, it assesses the preparedness of Milaor, San Fernando, and Pasacao in terms of training, equipment, and human resources, and proposes evidence-based interventions to strengthen DRRM systems and improve community resilience to flood-related disasters.

Scope and delimitation - This study assesses the Disaster Risk Reduction and Management (DRRM) readiness of Pasacao, San Fernando, and Milaor municipalities in Camarines Sur, Philippines, which are highly vulnerable to flooding. It evaluates the preparedness of local government units and communities in managing flood-related disasters, focusing on DRRM council functionality, early warning systems, evacuation plans, and community awareness. Data was collected through surveys, interviews, and document analysis involving DRRM officers and barangay officials. The findings are limited to the research period and rely on self-reported data, providing a snapshot of DRRM readiness in these municipalities.

Theoretical Framework - This study is based on three theoretical frameworks that provide a comprehensive understanding of disaster risk reduction and management in the Philippines' flood-prone municipalities. These frameworks consider disasters as a result of natural hazards and social, economic, and institutional factors. They help examine local governments' and communities' preparedness, response, and recovery from flooding, and their resilience and adaptability. The Social Cognitive Theory (SCT) suggests DRRM readiness is influenced by learned behaviors, such as self-efficacy and observational learning. Communities observing effective disaster responses adopt similar behaviors, enhancing readiness. The Protection Motivation Theory (PMT) explains motivation to prepare for floods depends on perceived risk severity, vulnerability, and belief in effective measures. The Theory of Planned Behavior (TPB) states disaster preparedness is influenced by attitudes, social norms, and perceived control. These frameworks are supported by studies on flood risk forecasting and DRRM implementation in the

Bicol Region. This study assesses DRRM readiness in Camarines Sur, identifying gaps and areas for improvement.

2. Methodology

This study aims to assess DRRM readiness in Camarines Sur, identifying gaps and areas for improvement. This chapter presents the methodology used in collecting the data for the study. It includes Research Design, Research Method, Population and Sampling design, Data Gathering procedure, and the statistical Treatment and data employed in data analysis to interpret the pertinent information gathered.

Research design - This study employed a mixed-method research design, combining quantitative and qualitative approaches to assess the Disaster Risk Reduction and Management (DRRM) readiness of flood-prone municipalities in Camarines Sur. A structured survey questionnaire was used to collect numerical data, which was analyzed using statistical tools to determine the level of readiness. Additionally, qualitative data was gathered through open-ended questions and interviews to provide insights into DRRM implementation, challenges, and best practices, offering a comprehensive understanding of the municipalities' preparedness.

Research method - The study used a survey questionnaire and in-depth interviews to gather data on DRRM preparedness in flood-prone municipalities. The questionnaire included Likert-scale and open-ended questions on early warning systems, emergency response plans, and community participation. Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to analyze the data, with results presented in tables and graphs to highlight strengths and weaknesses in local DRRM efforts.

Population and sampling - The study targeted Municipal DRRM Office staff and DRRM focal persons in Pasacao, San Fernando, and Milaor, Camarines Sur, due to their key roles in disaster management. Using Slovin's formula, a sample size of 46 was determined from a total population of 54 DRRM personnel, ensuring a high representation. The breakdown includes 15 respondents from Milaor, 17 from San Fernando, and 14 from Pasacao. This sample size provides reliable data on DRRM readiness, with mean scores interpreted as Very High (4.21-5.00), High (3.41-4.20), Moderate (2.61-3.40), Low (1.81-2.60), or Very Low (1.00-1.80) readiness, allowing for a balanced assessment in these flood-prone municipalities.

Data gathering - To gather accurate data on DRRM readiness in a flood-prone Camarines Sur municipality, researchers secured approval from their academic institution, local government, and MDRRMO, and sent formal requests to municipal authorities. They administered surveys to DRRM officers through assisted interviews, explaining the study purpose and ensuring voluntary participation and confidentiality. Key informant interviews were conducted in the local language with consent and note-taking. Participants were informed about the study and signed consent forms, with data kept confidential and anonymous. After collection, data was sorted, transcribed, and analyzed using descriptive statistics and thematic coding, ensuring a comprehensive and reliable assessment of DRRM readiness.

Statistical treatment of data - The data was analyzed using percentage to show the proportion of responses, mean to measure the average readiness level, and Slovin's Formula to determine the sample size from the known population of DRRM personnel in Camarines Sur.

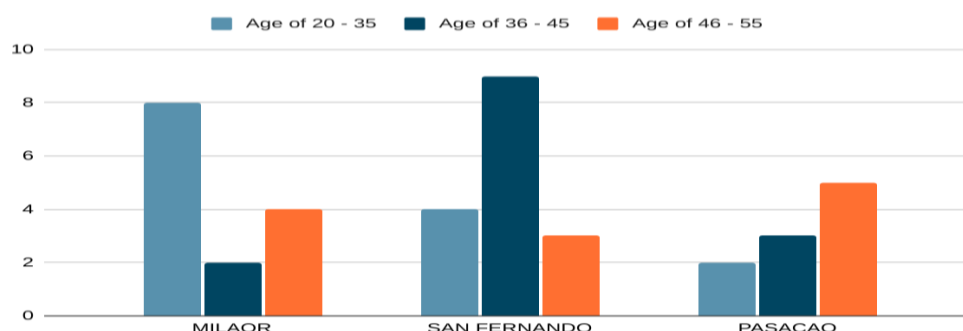
3. Result and discussion

This section presents the demographic profile of respondents and statistical data related to the study's objectives, focusing on key variables and patterns. Data was collected through survey questionnaires and in-depth interviews, providing both structured and detailed insights. The age distribution is fairly balanced, with the largest group being 21-27 years (24%), followed by 28-34 years (20%) and 35-41 years (20%). The 42-48 years and 49-55 years groups each contribute 18%, indicating participation from working-age individuals across various age ranges.

3.1 Demographic profile

Figure 1

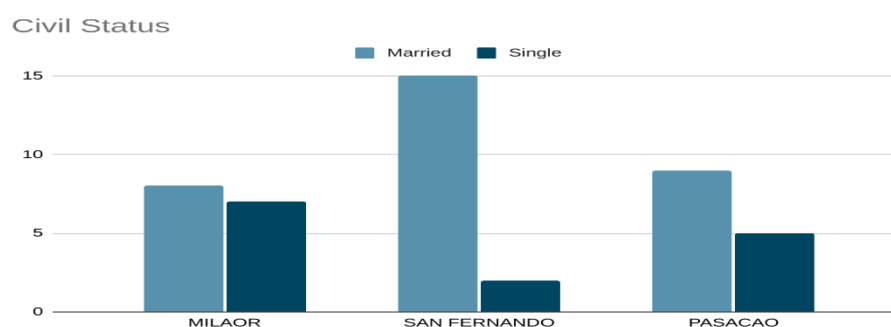
Respondent's Age



The age distribution of DRRM personnel in Milaor, San Fernando, and Pasacao, Camarines Sur, shows varying profiles. In Milaor, most personnel are 20-35 years old, indicating a younger workforce with potential adaptability to emergency response. San Fernando's workforce is dominated by 36-45-year-olds, combining experience and capability. In Pasacao, most personnel are 46-55 years old, suggesting reliance on experience and leadership. This diversity aligns with NDRRMC's value on age diversity in DRRM roles, impacting disaster preparedness and response approaches.

Figure 2

Civil Status of the Respondents



The civil status of DRRM personnel in Milaor, San Fernando, and Pasacao, Camarines Sur, shows a predominance of married individuals. In Milaor, married respondents slightly outnumber single ones, suggesting family responsibilities influence their disaster preparedness commitment. San Fernando has a significant majority of married respondents, indicating stable, long-term service in DRRM roles. Pasacao's distribution is relatively balanced, but still dominated by married personnel. Overall, married individuals comprise the majority, potentially contributing to effective planning and decision-making in flood-prone areas, aligning with UNDRR's findings on demographic diversity in DRRM teams.

The educational attainment of respondents in Milaor, San Fernando, and Pasacao, Camarines Sur, shows college graduates constitute the largest proportion, with San Fernando having the highest number, followed by Milaor and Pasacao. Undergraduates are present in all areas, with Pasacao having slightly higher numbers. Vocational graduates represent the smallest group, with San Fernando having the lowest. San Fernando's high number of college graduates may indicate higher preparedness and organizational readiness in DRRM activities. The presence of undergraduates and vocational graduates highlights the need for inclusive DRRM communication strategies. Overall, the educational profile is favorable, but continuous capacity-building programs are needed, particularly for those with lower educational attainment, to ensure equitable preparedness and resilience, as

supported by Lavell et al. (2019).

Figure 3

Educational Attainment

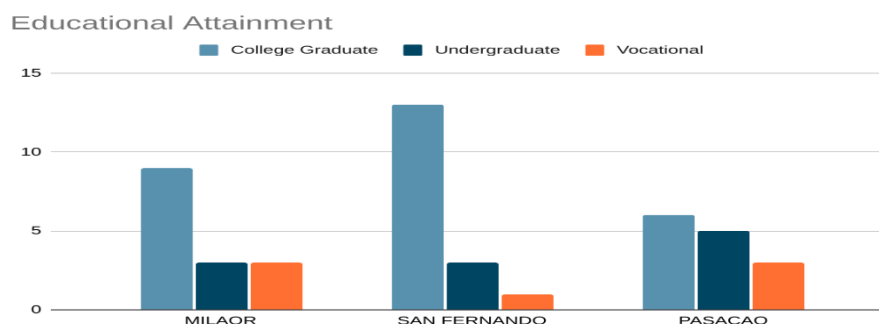
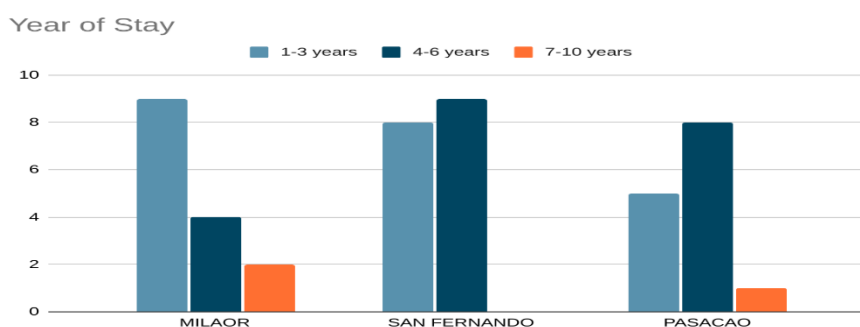


Figure 4

Year of Stay of the Respondents



The length of residency in Milaor, San Fernando, and Pasacao shows most respondents have lived in their communities for 1-6 years. In Milaor, majority have stayed 1-3 years, followed by 4-6 years. San Fernando has an even distribution between 1-3 and 4-6 years, with no respondents in the 7-10 years category, suggesting a mobile population. Pasacao's respondents are mostly 4-6 years, followed by 1-3 years. The findings highlight the need for continuous DRRM orientation and training, especially for newer residents, aligning with the Philippine DRRM Act of 2010 and national mandates for local government units to implement targeted orientation.

3.2 Level of Disaster Risk Reduction Management Readiness of the Flood Prone Municipalities

Table 1

Training and Capacity Building

Municipality	Weighted Mean	Verbal Interpretation	Rank
Milaor	4.77	Very High Readiness	2
San Fernando	4.60	High Readiness	1
Pasacao	4.98	Very High Readiness	3

Pasacao shows the highest DRRM training readiness with a Weighted Mean of 4.98 ("Very High Readiness"), indicating significant investment in training and capacity building. Milaor follows with a Weighted Mean of 4.77 ("Very High Readiness"), showing strong DRRM commitment. San Fernando ranks 3rd with a Weighted Mean of 4.60 ("High Readiness"), suggesting room for enhancing training programs. The findings align with literature on LGUs' role in disaster preparedness (Lorenzo, 2024) and RA 10121's mandate for LGUs to strengthen disaster preparedness.

Table 2*Equipment and Facilities*

Municipality	Weighted Mean	Verbal Interpretation	Rank
Milaor	4.52	Very High Readiness	1
San Fernando	4.73	Very High Readiness	3
Pasacao	4.62	Very High Readiness	2

Milaor leads in DRRM equipment and facilities with a weighted mean of 4.52 ("Very High Readiness"), indicating comprehensive resources and proactive preparedness. Pasacao ranks 2nd with 4.62 ("Very High Readiness"), showing strong foundational preparedness. San Fernando ranks 3rd with 4.73 ("Very High Readiness"), suggesting scope for optimizing equipment and facilities. The municipalities' high readiness aligns with RA 10121's mandate for LGUs to allocate funds for disaster response resources and infrastructure, and studies highlighting access to equipment as critical for effective emergency response (Coppola, 2015).

Table 3*Human Resource and Institutional Readiness*

Municipality	Weighted Mean	Verbal Interpretation	Rank
Milaor	4.76	Very High Readiness	3
San Fernando	4.69	Very High Readiness	2
Pasacao	4.97	Very High Readiness	1

Pasacao leads in human resource and institutional readiness with a Weighted Mean of 4.97, indicating optimized DRRM preparedness. San Fernando follows with 4.69, showing strong readiness with room for improvement. Milaor ranks 3rd with 4.76, still "Very High Readiness", but with opportunities for enhancement. The municipalities' high readiness aligns with RA 10121's mandate for LGUs to strengthen institutional capacity and Coppola's (2015) emphasis on human resources and institutional systems as core to disaster preparedness.

4. Summary of findings, Conclusions, and Recommendations

This section presents the summary and conclusion derived from the study that identifies the level of readiness of Disaster Risk Reduction Management in the flood-prone municipality in Camarines Sur. This section also provides recommendations that can be used by the local government.

Summary of findings - The respondents from Milaor, Pasacao, and San Fernando are mostly young to middle-aged, with males dominating the sample, and most having college degrees. Many have lived in their municipalities for 2-5 years, indicating varying levels of local knowledge and disaster risk awareness, which may impact their participation in disaster risk reduction initiatives. The municipalities show high to very high DRRM readiness in training, equipment, and institutional capacity, with Pasacao leading in training and human resource readiness, and Milaor topping in equipment and facilities. Respondents aged 35-41 are more involved in disaster preparedness. Despite high readiness, challenges persist, including limited DRRM training access, equipment shortages, human resource gaps, environmental vulnerability, and financial constraints.

The municipalities' low-lying terrain and proximity to rivers make them flood-prone, straining disaster response capacities. ANOVA results show Milaor has a higher readiness level than San Fernando, but Pasacao's readiness is comparable to both. All municipalities fall under "Very High Readiness", with Milaor scoring highest. San Fernando faces high risks from typhoons and floods, with gaps in community preparedness, highlighting the need for regular drills and training. Efficient early warning systems and communication networks are lacking, and infrastructure like evacuation centers and drainage systems aren't fully disaster-resilient. Environmental degradation worsens flooding, so reforestation and river clean-up are needed. Coordination among local units, schools, and communities is insufficient, and public awareness on disaster management needs boosting.

Conclusion - The respondents are mostly male, educated, and of working age, indicating potential for active participation in community and disaster activities, with their high educational level able to boost DRRM awareness and response. However, limited female representation and varying educational backgrounds suggest a need for more inclusive participation, and differences in residency duration imply varying levels of familiarity with local

risks and response systems. The municipalities of Milaor, San Fernando, and Pasacao in Camarines Sur have achieved a high level of DRRM readiness, with trained personnel, adequate equipment, and strong institutional frameworks, but challenges like limited specialized training, resource shortages, and environmental vulnerabilities persist. Community participation, particularly from mid-age groups, plays a key role in DRRM initiatives. To sustain and improve disaster preparedness, strengthening training, resource management, institutional coordination, and environmental strategies is crucial.

The DRRM readiness levels of Milaor, San Fernando, and Pasacao aren't uniform, with Milaor showing significantly higher readiness than San Fernando, but all three are classified as "Very High Readiness", indicating they have necessary structures and strategies to manage disasters like flooding. Continuous improvement of DRRM programs is needed, addressing gaps in municipalities like San Fernando, to achieve balanced readiness and enhance community resilience. San Fernando's vulnerability to natural hazards makes strengthening Disaster Risk Reduction and Management readiness a critical priority. Without improved community preparedness, modern warning systems, resilient infrastructure, environmental protection, and strong institutional coordination, the municipality will continue to face significant risks to life, property, and livelihood during disasters.

Recommendations - To enhance DRRM readiness, it's essential to aim for gender balance by encouraging women to participate more in programs and decision-making. Providing targeted training for those with lower educational backgrounds using simple, practical approaches can also help. Regular seminars and drills for all residents can improve disaster preparedness knowledge, while leveraging college graduates as DRRM leaders or volunteers can spread awareness. Integrating new residents into local systems and tapping long-term residents' experience can also be beneficial. Continuously monitoring demographic profiles can keep DRRM programs inclusive and relevant.

Enhancing training programs with regular drills and specialized sessions for personnel and barangay responders is also crucial. Investing in more disaster response equipment like rescue boats and communication devices, and ensuring they're well-maintained, can improve response capabilities. Appointing permanent, trained staff to DRRM offices can also enhance coordination. Improving early warning systems and communication networks can provide timely information dissemination. Implementing flood mitigation programs, like drainage improvements and reforestation, can reduce risks. Utilizing the Local Disaster Risk Reduction and Management Fund effectively and encouraging community participation in DRRM activities can strengthen resilience. Future research can explore community resilience, disaster recovery, and early warning system effectiveness.

Enhancing capacity-building with regular training, workshops, and simulations for personnel, and allocating sufficient resources for equipment, early warning systems, and evacuation facilities are also necessary. Fostering inter-municipal collaboration among Milaor, San Fernando, and Pasacao, and strengthening community-based DRRM programs through awareness campaigns and training at the barangay level, can also improve readiness. Continuously monitoring and updating DRRM policies can keep them adaptive and responsive to emerging challenges. For San Fernando, implementing targeted training programs and drills, allocating more funds for early warning systems and equipment, and encouraging inter-municipal collaboration can help. Intensifying information campaigns at the barangay level can empower residents, and regularly reviewing and updating DRRM policies can keep them adaptive and inclusive.

Practical educational implications - it involves integrating DRRM concepts into school curricula with hands-on training and simulations, organizing regular drills for students and staff, and encouraging community engagement. Students can develop skills like first aid and emergency response while promoting environmental conservation. Schools can partner with local governments and NGOs to support these initiatives, using local contexts to make learning more relevant. This approach can foster a culture of disaster resilience and preparedness among students, teachers, and the community, ultimately contributing to more effective disaster management in municipalities like Milaor, Pasacao, and San Fernando.

Implication for practitioners - for DRRM officials and local government units, it's crucial to focus on

inclusive and targeted training programs that address gaps in equipment and human resources. Strengthening community participation, especially among females and new residents, is also key. Enhancing early warning systems, communication networks, and infrastructure resilience should be prioritized, alongside environmental protection and reforestation efforts.

Implication for teacher - teacher play a crucial role in shaping the next generation's disaster resilience. Integrate DRRM concepts into your school curricula, emphasizing practical skills and awareness. Organizing regular drills and training sessions for students and staff, making sure everyone knows what to do in case of an emergency. This hands-on approach will not only prepare them for disasters but also help them develop valuable life skills. Collaborate with other teachers to incorporate DRRM into various subjects, like science, social studies, or even physical education. By doing so, they will be helping create a culture of disaster preparedness in school and community.

Implication for students - students have a vital role in promoting disaster resilience in school and community. Participating in DRRM initiatives and sharing what they learned with their families and neighbors, it is a great opportunity to develop skills in disaster preparedness, response, and mitigation, which will benefit all. Joining school clubs or groups focused on DRRM, and get involved in activities like emergency drills, first aid training, or environmental clean-up drives. By taking an active role, students will not only be prepared for disasters but also contribute to making your community safer and more resilient. Plus, they will gain valuable experience and skills that will serve them well throughout their life.

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