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Financial literacy and sustainable development of microentrepreneurs in San Jose, Occidental Mindoro

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Abstract

This study was conducted purposely to improve the financial literacy of microentrepreneurs in San Jose, Occidental Mindoro, to ensure the sustainable development of their business. This study identified the areas of financial literacy of microentrepreneurs that need improvement. This study revealed the extent of microentrepreneurs' financial literacy in financial planning, cash management, and loan management. Moreover, the level of sustainable development in terms of business management decisions, effective debt repayment, and societal benefits was also revealed, as was the relationship between financial literacy and sustainable development. A validated and reliable set of questionnaires was used to gather data from two hundred fifty-five (255) microentrepreneurs in San Jose, Occidental Mindoro. The study showed a great level of financial literacy in financial planning, cash management, and loan management. A high level across the three examined dimensions of sustainable development, such as business management decision, effective debt payment, and societal benefit, was also indicated. The study further revealed that the level of financial literacy among microentrepreneurs is significantly related to their level of sustainable development. It is then concluded that stronger financial knowledge and sound financial practices can support sound business management decisions, effective debt repayment, and enhanced societal benefit. However, the findings also revealed that financial planning is not significantly related to business management decisions. The researcher proposed and recommended a financial literacy program to help microentrepreneurs improve their financial literacy and ensure the sustainable development of their businesses. The collaborative efforts of the local government unit and agencies, as well as financial and academic institutions, will likely improve microentrepreneurs' financial literacy, enabling them to manage their businesses more effectively.

Keywords: financial literacy, sustainable development, microentrepreneurs, financial management practices, financial planning

Financial literacy and sustainable development of microentrepreneurs in San Jose, Occidental Mindoro

1. Introduction

Microenterprises are vital to local communities because they typically drive economic activity by providing essential goods and services (Yparraguirre, 2025). They comprise most of the country's businesses, which is why it is safe to assume that they are also the major source of employment nationwide. Based on the 2023 List of Establishments (LE) of the Philippine Statistics Authority (PSA), micro, small, and medium enterprises (MSMEs) account for 99.63% (1,241,733) of the country's 1,246,373 operating business establishments. Out of these 1,241,733 establishments, 90.43% (1,127,058) are microenterprises (Department of Trade and Industry Philippines, 2025a). Despite their significant contribution to the Philippine economy, many microenterprises struggle to remain sustainable. Key challenges include microentrepreneurs' deficiencies in financial literacy. Each business day, microentrepreneurs manage their business's cash flow, record-keeping, spending, utilizing profits, borrowing, and even investing. However, financial literacy is still not a common term for most of them (Bancoro, 2023). Klapper et al. (2015) highlighted that financial literacy refers to a person's knowledge about basic financial concepts, the absence of which may result in the inability to make sound financial decisions.

As various global studies have concluded, financial literacy plays a vital role in improving the performance and sustainability of microenterprises. For instance, a study by Kaur and Bansal (2020) demonstrated that financial literacy, along with financial access and business growth, was positively correlated with a firm's sustainability. Likewise, research across diverse contexts has shown that enhanced financial literacy improves the capacity of micro, small, and medium enterprises to manage resources, integrate financial technologies, and promote inclusivity, all of which contribute to sustainability (Ristati et al., 2024). In addition, Klapper and Lusardi (2019) emphasized that individuals with strong financial skills are more effective at planning and saving for retirement. Moreover, financially literate investors are more likely to invest in diverse industries (Abreu & Mendes, 2010, as cited in Klapper et al., 2015).

Grounded in global evidence highlighting the impact of financial literacy on the sustainability of microenterprises, national studies have also recognized its crucial role in the sustainable development of businesses in the Philippines. Among these are Gonzalvo and Avila (2019), who found a significant relationship between microentrepreneurs' financial literacy and business longevity. On the other hand, Corpuz (2022) investigated the influence of owners' financial literacy on the financial outcomes of microenterprises in the province of Bulacan. In addition, Bancoro (2023) studied the financial literacy of MSME business owners in San Jose, Negros Oriental, and concluded that microentrepreneurs' financial literacy positively impacts the overall performance of their businesses.

While there are a few studies specifically related to the microenterprises of Occidental Mindoro such as the study of Bangisan et al. (2023) which examined the level of e-commerce application among MSMEs in San Jose, Occidental Mindoro, and the study of Correa and Galay-Limos (2024), which analyzed the effects of digital literacy on the digitalization of business name registration for microenterprises, there remains a scarcity of empirical research examining the relationship between financial literacy and the sustainable development of microentrepreneurs in the province. Recognizing this gap, this study aims to contribute to the existing body of knowledge by providing an empirical analysis of how financial literacy influences the sustainable development of microenterprises in Occidental Mindoro.

Statement of the Problem - The purpose of this study was to explore aspects of microentrepreneurs' financial literacy to support sustainable development. Specifically, the study sought to answer the following questions: (1) What aspects of financial literacy of the microentrepreneurs may be improved to ensure the sustainable

development of their business? (2) What is the extent of financial literacy of the microentrepreneurs in terms of financial planning, cash management, and loan management? (3) What is the level of sustainable development of the microentrepreneurs in terms of business management decisions, effective debt payment, and societal benefits? (4) Is there a significant relationship between the extent of financial literacy and the level of sustainable development of microentrepreneurs? (5) What financial literacy program may be formulated to enhance the financial literacy of the microentrepreneurs to support the sustainable development of their business?

Significance of the Study - The results of this study will be of great benefit to the following: entrepreneurs and owners of existing microenterprises will likely gain insight into their own level of financial literacy. They may use the results of this study to bridge the gaps in various financial literacy concepts. They may also use the results as guides to formulate strategies that will promote business sustainability. The community will benefit from improved business performance by microenterprises, as these businesses may create employment and stability in the local economy. Existing business establishments will also benefit from this study because improved microenterprises will become more reliable partners, suppliers, and distributors. The LGU will benefit because this may serve as an evidence-based resource material in formulating future policies, programs, and initiatives for local microentrepreneurs. As with the LGU, this study will also serve the DTI as a resource for creating future policies, programs, and initiatives for microentrepreneurs. Also, for financial institutions, banks are the next possible beneficiaries of this study, as this will emphasize the financial literacy needs of microentrepreneurs. This will enable banks and other financial institutions to develop financial products and services that improve access to loans and payment capacity. For the Academe, the results of this study will contribute to the literature on financial literacy and the sustainable development of microentrepreneurs at academic institutions offering business and management programs. Lastly, this study will provide significant information for future researchers undertaking studies on financial literacy, covering aspects not included in this study.

Scope and Delimitation of the Study - The study focused on the relationship between financial literacy and the sustainable development of microentrepreneurs in San Jose, Occidental Mindoro. It also assessed the extent of microentrepreneurs' financial literacy in key areas, including financial planning, cash management, and loan management. In addition, the study also evaluated the level of sustainable development of microentrepreneurs in terms of business management decisions, effective debt management, and societal benefits. The scope of microentrepreneurs in this study was based on the definition stated in Section 3 of the Republic Act 9501, otherwise known as the "Magna Carta for Small Enterprises", which states that any business activity or enterprise engaged in industry, agribusiness, and/or services, whether single proprietorship, cooperative, partnership or corporation whose total assets, inclusive of those arising from loans but exclusive of the land on which the particular business entity's office, plant, and equipment are situated, must have value falling under ₱3,000,000.00 and below. Moreover, this study was limited to the list of registered and operating microenterprises provided by the Business and Licensing Office of the Municipality of San Jose, Occidental Mindoro, as of January 31 of 2025. The study was conducted from August 2025 to March 2026.

2. Methodology

Research Design - The study employed an exploratory sequential research design that began with a qualitative phase to interpret participants' responses and identify the variables. It enabled an exploration of the complexity surrounding financial literacy on the sustainable development of microenterprises in Occidental Mindoro. Furthermore, Gerzso and Reidl (2024) pointed out that the mixed-method approach intensifies the findings by combining different data sources. In addition, Fraenkel et al. (2013) and Creswell and Creswell (2018) emphasized that the results of the qualitative phase will inform the quantitative method, and quantitative results will be used to validate the qualitative findings. For the qualitative phase, data were gathered using an interview schedule; for the quantitative phase, a validated and reliable questionnaire was used. Descriptive research was used to measure the extent of financial literacy and the level of sustainable development. A descriptive correlational design was employed to measure the relationship between the independent and the dependent variables.

Respondents of the Study - To gather qualitative data, the proponent used simple random sampling to select the twenty (20) microentrepreneurs who participated in the face-to-face interview to discover the aspects of their financial literacy that may be improved. The participants comprised diverse businesses. These participants had been carefully selected for their significant contributions to the locality's business. On the other hand, from a total population of seven hundred fifty-six (756) microentrepreneurs, a sample size of two hundred fifty-five (255) respondents for the quantitative phase were included, using Raosoft computation, with 5% margin of error and a 95% confidence level. The proponent used stratified random sampling (SRS) for respondent selection in the quantitative part, wherein the population was grouped into eighteen (18) industry classifications, and respondents were randomly drawn from each group to ensure that each industry was properly represented. Bell et al. (2022) emphasized that the sampling technique enables the selection of the target group or individual with particular experiences, thereby enhancing the depth of the data collected. Their knowledge and experience could produce credible and trustworthy findings.

Research Instrument - For the qualitative phase, an open-ended question was utilized in this study. For the quantitative phase, the research instrument was a researcher-made questionnaire. The first part was used to measure the extent of financial literacy, as per the survey results, including financial planning, cash management, and loan management. The second part concerned the level of sustainable development among microentrepreneurs, as reflected in business management decisions, effective debt repayment, and societal benefits. In responding to Part I of the questionnaire, the respondent was asked to rate each statement by checking the box corresponding to their level of agreement on a 4-point Likert scale. On the other hand, in responding to Part II of the questionnaire, the respondent was asked to rate each statement by checking the box corresponding to the frequency level using the Likert scale: 4-Often; 3-Sometimes; 2-Rarely; 1-Never. Expert validity was used to assess the questionnaire's validity. The researcher sought assistance from five experts: three (3) are graduate school professors at the Divine Word College of San Jose, and two (2) are professors at Occidental Mindoro State College, to evaluate the appropriateness of the questionnaire items with respect to the variables and topics under investigation. The experts' comments and suggestions were incorporated into the final copy of the researcher-developed instrument.

A group of thirty (30) microentrepreneurs served as respondents to the 54-item researcher-made questionnaire. The questionnaire consisted of six distinct characteristics, namely: Financial Planning, Cash Management, Loan Management, Business Management Decision, Effective Debt Payment, and Societal Benefits. The reliability of the research instrument was tested using Cronbach's Alpha, a standard measure of internal consistency. This coefficient determines how closely related a set of items is as a group.

Table 1
Result of Reliability Analysis

Items	Number of Items	Reliability Coefficients*	Analysis
I. Financial Literacy (8 items each)			
1. Financial Planning	8	0.955	Very High Reliability
2. Cash Management	8	0.954	Very High Reliability
3. Loan Management	8	0.927	Very High Reliability
II. Sustainable Development of Microenterprises (10 items each)			
1. Business Management Decision	10	0.947	Very High Reliability
2. Effective Debt Payment	10	0.872	High Reliability
3. Societal Benefit	10	0.782	High Reliability

*Based on standardized items

Values above 0.70 generally indicate high reliability, and values above 0.90 indicate very high reliability. Table 1 summarizes the consistency across all measured constructs based on standardized items. All constructs within financial literacy yielded very high reliability coefficients ranging from 0.927 to 0.955, indicating excellent consistency and that the items are closely aligned in measuring these constructs. Under sustainable development, the societal benefit scale registered the lowest Alpha of 0.782 but remains above the acceptable threshold of 0.70 (Hair et al., 2019). Overall, the research questionnaire demonstrates strong internal reliability, suggesting that the items are well understood by respondents and consistently measure the intended variables.

Data Gathering Procedure - For both the qualitative and quantitative phases, a request letter, signed by the proponent's adviser and addressed to the Business and Licensing Office of the Municipality of San Jose, Occidental Mindoro, was prepared to obtain the list of microenterprises in San Jose, Occidental Mindoro. For the qualitative part, an interview guide was prepared, and interviews were conducted face-to-face. The qualitative data gathering was completed within seven (7) days. For the quantitative part, printed questionnaires were distributed to respondents face-to-face. Then, the data collected were tabulated, analyzed, and interpreted by the researcher, with guidance from the statistician and the adviser. Statistical analyses were done using the appropriate statistical software. The quantitative data collection process was completed within fifteen (15) days.

Statistical Treatment of the Data - For the qualitative phase, thematic analysis was done. It was coded to identify the initial and final themes and to determine the independent variables for the quantitative phase. The weighted mean, generated in SPSS Version 26, was used to describe the extent of financial literacy and the level of sustainable development among the respondents. To establish the significant relationship between the independent variable (IV) and the dependent variable (DV), the statistical software Warp PLS Version 7.0 was used.

Ethical Considerations - Ethical considerations were taken seriously to maintain the integrity of the research and protect the respondents in compliance with the Data Privacy Act of 2012 (RA10173). First, an informed consent form was provided, clearly explaining the purpose of the study and how the data would be used. This study strictly observed the ethical standards in conducting the research. The respondents' participation was voluntary, and they were informed of their right to withdraw at any time without consequence. All gathered information was treated with confidentiality and anonymity, and the data was used solely for academic purposes. Moreover, it was disposed of properly in accordance with privacy protocols. No deceptive practices or coercive methods were employed during data collection.

3. Results and Discussions

The researcher prepared one open-ended question about the financial literacy of microenterprise owners: "As a microentrepreneur, in what areas of financial literacy do you experience deficiencies or lack confidence? After being informed of the study's purpose, 20 microentrepreneurs voluntarily participated in the qualitative phase and openly shared their views and experiences during the interview. Their responses were presented through both direct and indirect quotations and subsequently condensed into brief phrases capturing the central ideas of each. The data were then systematically coded and grouped into subthemes, as illustrated in Figure 1. Figure 1 presents the web graphic of the initial thematic analysis on financial literacy. The interview sessions identified areas of financial literacy in which the microenterprise owners experienced deficiencies and lacked confidence. Sixteen clusters of themes were initially generated from the responses. This aligns with the study by Padi et al. (2025), which concluded that financial literacy among small- and medium-enterprise owners remains a challenge in developing economies. Similarly, Agyapong and Attram (2019) reported that many small and medium enterprise owners lack the financial knowledge, skills, and awareness necessary to manage their business finances and improve performance and sustainability effectively.

Moreover, the System Theory developed by Newman and Newman (2022) is clearly manifested in Figure 3. The thematic map shows that financial literacy serves as the connecting element, facilitating interaction among these three financial subsystems. Systems Theory explains that when cash management, financial planning, and loan management function effectively together, the enterprise becomes more stable and better able to sustain its operations. However, if one area becomes weak, it can affect the entire financial system of the business. Figure 1 illustrates how the financial practices of microenterprise owners are interconnected. Strengthening financial literacy helps improve how these financial areas work together, enabling business owners to manage resources more effectively, make sound financial decisions, and support the long-term sustainability of their enterprises.

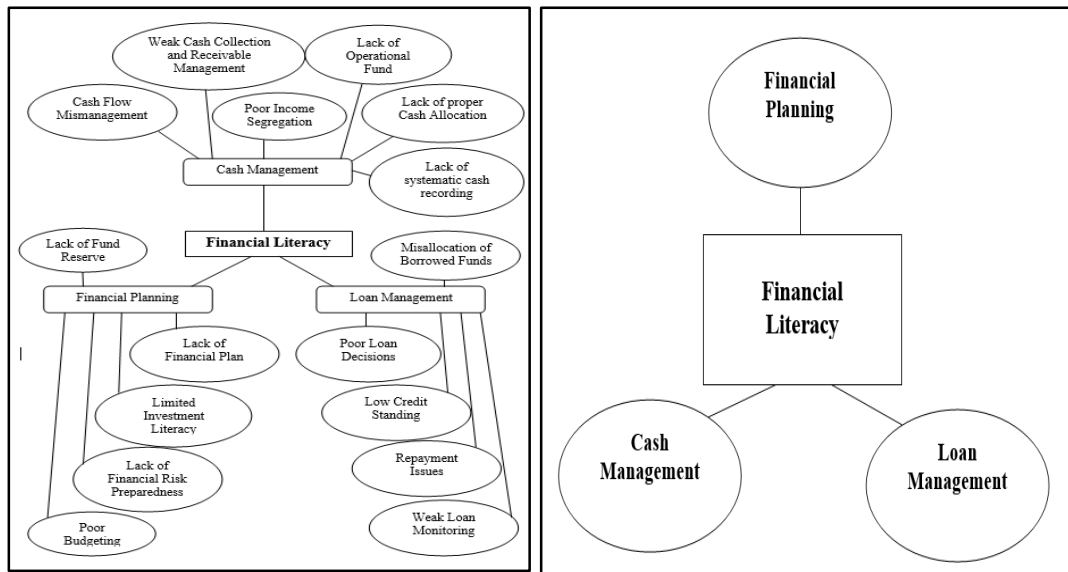
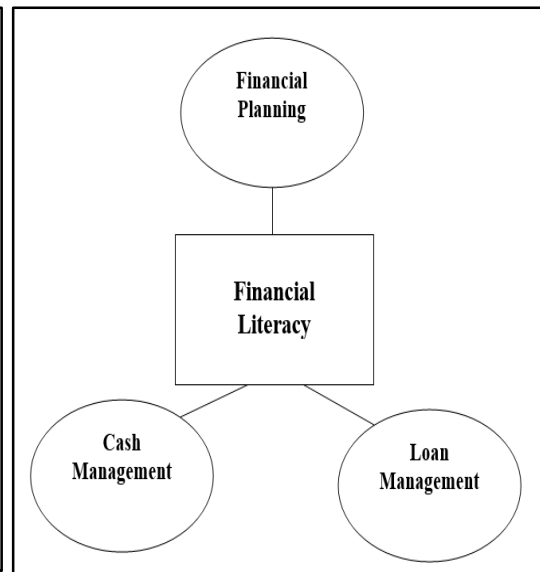


Figure 1. Initial Thematic Map of Financial Literacy Figure 2. Final Thematic Map of Financial Literacy



The clusters of themes were subsequently refined into three final themes, namely financial planning, cash management, and loan management. These themes served as key indicators of financial literacy to measure its extent among microentrepreneurs. The qualitative results of the study revealed that financial planning, cash management, and loan management are the primary indicators of financial literacy among microentrepreneurs, findings consistent with several existing studies. This is a clear illustration of the Human Capital Theory, which posits that an entrepreneur's financial knowledge significantly affects their performance in managing their business, thereby improving economic outcomes (Aman-Ullah et al., 2022). Financial planning, for instance, reflects the business owner's knowledge and ability to direct their financial resources to achieve stability and sustainability, which are the basic goals of a business. As explained by Salazar et al. (2024), financial planning involves practical actions such as maintaining financial records, controlling expenses, adjusting budgets in response to financial challenges, and preparing for future investments. These activities require a certain level of financial knowledge and discipline, which explains why they naturally surfaced in the participants' responses. Similarly, Samuels (2024) emphasized that financial planning plays a central role in achieving financial stability by supporting goal attainment, efficient resource use, risk management, and long-term financial security. Beyond planning, participants also highlighted the importance of managing daily financial transactions, which aligns with the concept of cash management. Although earlier defined by Ahmad (2016) as the process of monitoring and controlling cash inflows and outflows to maintain liquidity and support business sustainability, this practice remains a critical indicator of financial literacy in real-world business settings, as evidenced by the experiences of microentrepreneurs. Likewise, the theme of loan management emerged from the interviews as many microentrepreneurs rely on borrowed capital to sustain their operations. According to Bancoro (2023), loan management is an essential aspect of financial literacy because it involves identifying appropriate sources of financing, evaluating loan terms, using borrowed funds productively, and ensuring timely repayment.

Table 2 presents the level of financial literacy among microentrepreneurs; all three indicators indicate a high level. These results indicate that the respondents possess adequate financial literacy in terms of financial planning, cash management, and loan management. A high level of financial literacy reflects microentrepreneurs' ability to understand various financial concepts and apply appropriate financial practices. Among the three indicators, financial planning (3.66) got the highest composite mean; this result suggests clear manifestations of the respondents' well-established financial planning practices. These results are also consistent with established frameworks that identify financial planning, proper record-keeping, and setting financial goals as core drivers of microenterprises' sustainability and resilience. Evidently, the Organization for Economic Co-operation and

Development (OECD) concluded from its financial literacy studies that business owners who engage in planning and monitoring practices achieve stronger financial outcomes and higher survival rates (OECD, 2020). Several studies conducted globally have reported similar results. Just like the studies by Samiun et al. (2024) and Odonkor et al. (2024), which show that SMEs in Indonesia are actively engaged in financial planning, sustainable investment, and risk management. In addition, the study by Salazar et al. (2024) showed the same result for microentrepreneurs in Chachapoyas, Peru, indicating that 59% of respondents have a high level of financial planning. Similarly, the study of Guevara et al. (2022) showed that the majority of (52.42%) of the respondents, the microentrepreneurs in Guasave, Sinaloa, Mexico, have the skills and conditions for the financial planning of their business. In contrast, the study conducted by Bancoro (2023) revealed that a significant portion of MSME owners in San Jose, Negros Oriental, demonstrated limited financial planning knowledge and, in practice, neglected this component within their overall financial management framework. Moreover, it highlighted that the gap between knowledge of the importance of long-term planning and its implementation is an area of financial management that requires further education.

Table 2

Mean Extent of Financial Literacy of Microentrepreneurs in terms of Financial Planning, Cash Management, and Loan Management

Financial Planning	Weighted Mean	Interpretation
1. I prepare a clear long-term financial plan for my business.	3.67	High
2. I regularly set financial goals (e.g., sales, profit targets) for my business.	3.67	High
3. I allocate business funds for future investments.	3.71	High
4. I separate business from personal finances.	3.68	High
5. I monitor financial performance to guide long-term decisions.	3.67	High
6. I maintain financial records to track growth.	3.63	High
7. I believe that financial planning is the key factor in achieving financial security.	3.66	High
8. I believe that long-term investment provides an opportunity to increase wealth.	3.60	High
Composite Mean	3.66	High
Cash Management		
1. I allocate funds for regular business expenses.	3.66	High
2. I record all cash receipts and payments daily.	3.61	High
3. I closely monitor accounts receivable to ensure timely collection.	3.64	High
4. I maintain a record of all credit sales and follow up on unpaid accounts.	3.62	High
5. I separate personal and business cash transactions.	3.49	High
6. I avoid unnecessary cash withdrawals for non-business purposes.	3.59	High
7. I ensure that receipts or vouchers support all cash disbursements.	3.64	High
8. I prioritize payments according to due dates and importance.	3.73	High
Composite Mean	3.62	High
Loan Management		
1. I am aware of the loan products offered by financial institutions.	3.58	High
2. I carefully evaluate loan terms (e.g., interest rate, payment schedule) before borrowing.	3.52	High
3. I use loans primarily for productive business purposes rather than personal expenses.	3.58	High
4. I maintain a good credit record with financial institutions.	3.67	High
5. I prepare repayment plans before availing myself of loans.	3.68	High
6. I avoid over-borrowing beyond the repayment capacity of my business.	3.70	High
7. I regularly monitor my outstanding loan balances to ensure accurate tracking of repayments.	3.63	High
8. I maintain proper documentation of all loan transactions and repayment records.	3.59	High
Composite Mean	3.62	High
Overall Mean	3.63	High

Scale: 3.25-4.00 High; 2.50-3.24 Moderate; 1.75-2.49 Low; 1.00-1.74 Very Low

The same composite mean was observed for loan management (3.62) and cash management (3.62). In terms of loan management, the results imply a greater extent of financial literacy among microentrepreneurs. It is also observed that all eight statements are highly interpretable, with weighted means ranging from 3.52 to 3.70. These results imply that respondents apply loan practices, evaluate loan terms, plan repayments, monitor obligations, and use borrowed funds appropriately. A study by Cabueñas et al. (2025) examined how the level of financial literacy affects borrowers' loan repayment behavior in the Philippines. It concluded that responsible loan management and

monitored repayment are indicators of high financial literacy. Similarly, Agyapong and Attram (2019) concluded that financial literacy in entrepreneurs influences their capacity to assess financing needs and loan products, evaluate loan conditions, and make sound borrowing decisions. The strongest indicator, which obtained the highest weighted mean of 3.70, is the avoidance of over-borrowing and borrowing beyond repayment capacity. It implies that a significant number of respondents exhibit strong financial discipline regarding excessive borrowing. This result is a positive indication of effective loan management, which is essential to the business's financial stability. A study by Lusardi (2019) concluded that those who understood debt better were less likely to take out loans at high interest rates and better able to plan their repayments around their cash flow. Kaiser (2024) further stressed that understanding the terms of a loan immediately lowers the risk of becoming over-indebted.

Lastly, regarding cash management, the high level of financial literacy among microentrepreneurs in San Jose, Occidental Mindoro, is evidenced by a composite mean of 3.62. This implies that a significant number of respondents have a high level of literacy in cash management. In general, microentrepreneurs are expected to have a high level of literacy in cash management because it involves liquidity that directly determines the continuity of business operations, the capacity to meet debts, and overall sustainability. A study conducted by Tao and Sanchez (2025) examined the cash flow practices of microentrepreneurs. They found that proper record-keeping significantly affects a business's ability and sustainability. The strongest indicator, with a weighted mean of 3.73, shows that a significant number of microenterprise owners in San Jose, Occidental Mindoro, demonstrate strong discipline in managing financial obligations by prioritizing payments according to due dates to avoid penalties that could directly affect the business's operational funds. This demonstrates effective working capital management, which is more likely to affect liquidity and operational stability. These results coincide with the study of Yparraguirre (2025), which highlighted that the microenterprise owners in Cantilan, Surigao Del Sur, manifested the same high level of understanding regarding cash flow, monitoring of cash balances, and tracking payments; and with the study of Haavig (2019), which emphasized that practicing bank reconciliation, bookkeeping, and monitoring cash flow are clear manifestations of financial literacy. On the other hand, some studies contradict these results; for example, Ahmad (2016) found that the cash management practices of microentrepreneurs, particularly in the service industry across four states in Malaysia, remain low despite respondents' awareness of their importance.

Overall, the findings are consistent with Corpuz (2022), who concluded that informed financial decisions and favorable financial outcomes can be achieved through microentrepreneurs' financial knowledge, skills, and behaviors. Meressa's (2023) study indicated that financial literacy enables entrepreneurs to make sound financial decisions. Similarly, Deviyanti (2024) found that financial literacy plays a huge part in financial management practices. The study reveals that businesses with higher financial literacy demonstrated sounder financial planning and sound financial decision-making. Lastly, Aguilar et al. (2024) concluded that there is a positive relationship between cash management and business financial performance.

Table 3
Mean Level of Sustainable Development of Microentrepreneurs in terms of Business Management Decision

Business Management Decision	Weighted Mean	Interpretation
1. I analyze the history of business sales before making major purchasing decisions.	3.44	High
2. I use clear criteria when selecting business opportunities to avoid impulsive decisions.	3.46	High
3. My decisions related to my business operations are supported by data.	3.44	High
4. I apply strategic techniques when finding appropriate solutions to financial problems.	3.39	High
5. I follow rational processes when making business decisions to ensure the best possible outcomes.	3.42	High
6. I review the factors that impact my credit rating.	3.43	High
7. I apply business literacy to enhance my negotiation skills.	3.43	High
8. I use my business knowledge to mitigate potential risks.	3.42	High

9. I seek external information, such as market trends, when planning product offerings.	3.41	High
10. I analyze my business's capacity to handle potential risks associated with new plans.	3.43	High
Composite Mean	3.43	High

Scale: 3.25-4.00 High; 2.50-3.24 Moderate; 1.75-2.49 Low; 1.00-1.74 Very Low

Table 3 presents the data on the mean level of sustainable development of microentrepreneurs in terms of business management decisions, with a composite mean of 3.43, interpreted as high. This result implies that the respondents are generally able to make informed decisions in managing their business. Such a decision-making practice enables business owners to allocate resources effectively, mitigate risks, and respond to ever-changing market conditions. Entrepreneurship books emphasize that the ability to make informed, analytical decisions is fundamental to enabling small business owners to maintain operational efficiency and long-term viability (Barringer & Ireland, 2019; Scarborough & Cornwall, 2020). Based on the presented data, the strongest indicator, with a weighted mean of 3.46, concerns the respondents' ability to use clear criteria when selecting business opportunities to avoid impulsive decisions. This indicates that microentrepreneurs are carefully evaluating every aspect before investing their resources in potential opportunities. The practice of evaluating opportunity is a big help in ensuring the viability of business initiatives. The study of Karimi et al. (2017) showed that proper assessment of opportunity significantly improves the performance and sustainability of small businesses. Similarly, studies on MSME management also reported that careful evaluation of business opportunities strengthens operational planning and improves enterprise productivity (Capiña, 2021). In addition, Anoo et al. (2020) examined the financial management of MSMEs in Cebu. They found that effective management practices, such as regular evaluation of opportunities, have a significant impact on business performance and longevity. The other indicators also achieved high levels, with weighted means ranging from 3.39 to 3.44. The results indicate that the microentrepreneurs review operational data and business history before making major decisions. Analyzing past business experiences and performances enables entrepreneurs to make purchases more effectively.

According to Barringer and Ireland (2019), business owners can make sound, informed managerial decisions and reduce operational uncertainty by examining the business's sales, purchase, and financial records. Similarly, research on digital transformation among ASEAN MSMEs shows that the use of business information and data analysis strengthens competitiveness and supports business sustainability (ERIA, 2019). The indicator measuring microentrepreneurs' ability to seek relevant information, such as market trends, when planning product offerings, also achieved a high level, with a weighted mean of 3.41. This further indicates that the microentrepreneurs are aware of the importance of market conditions in decision-making. Gathering external information enables them to assess consumer preferences and respond to industry needs, which contributes to the long-term survival of microenterprises (Samson, 2025). Although still interpreted as high level, with a weighted mean of 3.39, the indicator measuring microenterprise owners' ability to apply strategic techniques to find appropriate solutions to financial problems obtained the lowest scores among the statement indicators. This result suggests that while respondents generally apply strategic thinking when addressing financial challenges, there may still be opportunities to further strengthen their strategic financial management skills. Strategic financial decision-making is essential because microenterprises often encounter limited resources and economic instability. According to the Philippine MSME Development Plan 2023–2028, strengthening entrepreneurial competencies such as financial analysis, strategic planning, and informed decision-making is necessary to improve the sustainability and competitiveness of micro and small enterprises in the country (Department of Trade and Industry, 2024).

Table 4 presents the mean Level of Sustainable Development of Microentrepreneurs with respect to Effective Debt Payment and Societal Benefit. A composite mean of 3.52 for effective debt payment, interpreted as high, is presented in Table 10, indicating the mean level of microentrepreneurs in this regard. The results indicate that the microentrepreneurs are making responsible, disciplined debt payments. These also suggest that a significant percentage of respondents are capable of carefully monitoring their debt obligations, creating repayment plans and strategies, and avoiding borrowing-related risks. Various studies on micro and small business financial

management have concluded that business owners' capacity to manage their debts responsibly and make timely repayments significantly impacts the long-term stability of their businesses (Roberts, 2018; Manyanga et al., 2023). Similarly, Morales's (2023) study indicated that business sustainability can also be achieved through owners' responsible borrowing practices and proper record-keeping. The indicator with the highest mean of 3.65 indicates that the microentrepreneurs are knowledgeable about the consequences and risks of excessive borrowing and of settling financial obligations through additional loans. This is a great example of business owners' prudent financial behavior that helps prevent debt accumulation and financial distress. The study by Elliyana et al. (2024), which focuses on the debt management of small and medium enterprises, concluded that business owners who exhibit responsible borrowing behavior are better able to maintain business stability and avoid debt-related risks. On the other hand, Manyanga et al. (2023) revealed that while disciplined borrowing improves business flexibility, enterprises' dependence on debt financing to sustain their operations negatively affects their long-term sustainability. The indicators related to allocating a fixed portion of business revenue to repay and borrow, based on the business's capacity to pay, also achieved high levels. This implies that the microentrepreneurs are practicing repayment planning and strategic borrowing for their business finances. The study by Supriyadi et al. (2024) on microenterprise financing indicated that a business's repayment performance and sustainability are influenced by debt repayment planning. The indicators related to microentrepreneurs' capacity to negotiate with lenders over their repayment terms also achieved a high level, with a weighted mean of 3.53. This result suggests that respondents can communicate with their lenders when they encounter financial difficulties. By negotiating repayment arrangements, they can address short-term cash flow challenges while maintaining good relationships with financial institutions. Kaya (2024) emphasized that open communication between borrowers and lenders is the fundamental means of improving repayments and avoiding defaults. In addition, Kitomo et al. (2020) identified additional ways to improve debt repayment, such as budgeting, monitoring obligations, and maintaining loan records.

Table 4

Mean Level of Sustainable Development of Microentrepreneurs in terms of Effective Debt Payment and Societal Benefits

Effective Debt Payment	Weighted Mean	Interpretation
1. I review past debt performance data of my business to assess the profitability of planned actions.	3.43	High
2. I assess potential loan risks before implementing new business initiatives.	3.41	High
3. I prepare a repayment schedule for each debt.	3.52	High
4. I allocate a fixed portion of revenue each month specifically for debt payments.	3.59	High
5. I keep complete records of all loan agreements.	3.46	High
6. I regularly review my financial records to ensure all loan-related information is accurate.	3.52	High
7. I avoid taking new loans to cover overdue loan payments.	3.65	High
8. I borrow from financial institutions only when I am sure I can repay the loan.	3.59	High
9. I negotiate repayment terms with lenders when cash flow is tight.	3.53	High
10. I communicated proactively when unable to repay.	3.47	High
Composite Mean	3.52	High
Societal Benefit	4.63	Very High
1. I engage in activities that increase my financial literacy to help reduce the burden on social safety.	3.11	Moderate
2. I participate in activities that help create a more educated citizenry capable of making informed choices.	3.09	Moderate
3. I communicate with government agencies to stay updated about the financial landscape.	3.13	Moderate
4. I conduct assessments of community needs to prevent aggressive competition.	3.23	Moderate
5. My business provides employment opportunities to residents.	3.40	High
6. I buy materials from other local businesses.	3.23	Moderate
7. I consider customer feedback when improving my products or services.	3.61	High
8. I make my products or services affordable to the local community.	3.63	High
9. I take steps to reduce energy in my operations.	3.55	High
10. I properly dispose of waste generated by my business.	3.91	High
Composite Mean	3.39	High

Scale: 4.20-5.00 Very High; 3.40 -4.19 High; 2.60-3.39 Moderate; 1.80-2.59 Low; 1.00-1.79 Very Low

Table 4 also shows that the composite mean level of sustainable development of microentrepreneurs in terms of societal benefit is 3.39, which is interpreted as high. This indicates that the microentrepreneurs are generally integrating socially responsible practices in the daily operations of their businesses, which includes several aspects. The first aspect is creating local jobs, supported by the study by Mile et al. (2022), which concluded that small businesses made a significant contribution to community employment. Other aspects include responding to the community's needs, supporting local industries, and implementing environmentally responsible practices. Balancing economic considerations with social and environmental responsibility reflects the principle of sustainable development (Muñoz & Cohen, 2018). Li (2023) claimed that businesses that implement sustainable practices, such as responsible financial conduct and community involvement, exhibit enhanced operational performance and facilitate poverty alleviation and social welfare. Kannan and Gambetta (2025) explained that the operational practices of sustainability-oriented SMEs play a significant role in advancing sustainable development goals. The study by Carroll and Brown (2018) also highlighted that businesses' responsibility to generate value extends not only to shareholders but also to employees, customers, communities, and the environment.

The strongest indicator, as shown in Table 4, with a weighted mean of 3.91, concerns proper waste disposal. This result clearly indicates that the microentrepreneurs are effectively implementing proper waste disposal practices. This aligns with the study by Casibang and Bilog (2025), which found that microenterprises commonly implement environmental practices, particularly the proper disposal of operational waste. It also indicates that the microentrepreneurs are doing the right thing in managing their waste. This aligns with the study by Semlai et al. (2024), which found that small and medium-sized enterprises achieve sustainability through green marketing practices, emphasizing that these businesses remain competitive despite the need to address environmental demands.

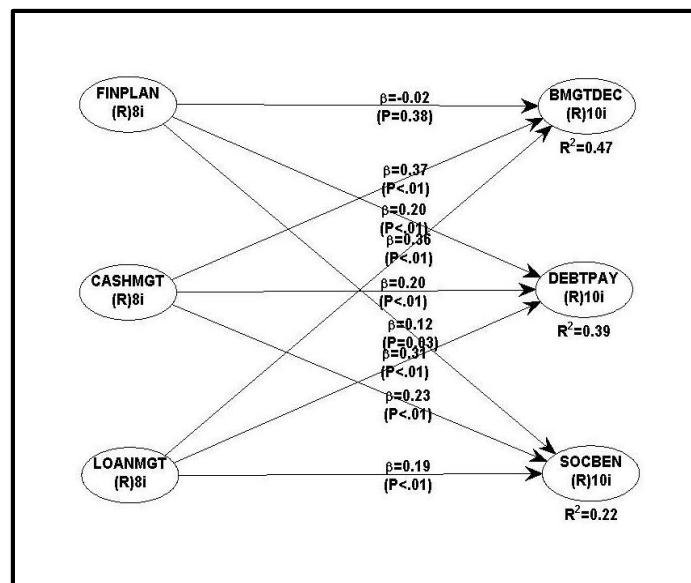


Figure 3. Structural Model of the Relationship Between Financial Literacy and Sustainable Development of Microentrepreneurs

The structural model displayed in Figure 3 illustrates the impact of financial literacy dimensions on the sustainable development of microentrepreneurs. The model was generated by WarpPLS version 7.0 using the Partial Least Squares Structural Equation Modeling (PLS-SEM). The structural model evaluates three exogenous variables or predictors: financial planning (FINPLAN), cash management (CASHMGT), and loan management (LOANMGT) against the endogenous variable or outcome represented by business management decision (BMGTDEC), effective debt payment (DEBTPAY), and societal benefits (SOCBEN). The model uses two primary statistical indicators to determine the strength and validity of these relationships. These are the path coefficients (Beta, β) and p-values. The beta coefficients represent the strength of the effect, with higher values indicating a

stronger relationship between the variables. The p-values indicate statistical significance, typically less than .05, suggesting the relationship is not due to chance. Coefficients of determination (R²) are also found under the endogenous variable and show the percentage of variance in the outcome explained by the three predictors combined. The values range from 0.22 to 0.49. The combined exogenous factors explain 47% of management decisions, 39% of debt payment behavior, and 22% of social benefits.

Table 5
Beta Coefficients of the Paths and p-values for Ho

Paths	Beta (β) Coefficient	p-value*	Interpretation
Ho: Financial Literacy→Sustainable Development			
FINPLAN→BMGTDEC	-0.019	0.378	Not Significant
FINPLAN→DEBTPAY	0.204	<0.001	Highly Significant
FINPLAN→SOCBEN	0.119	0.026	Significant
CASHMGT→BMGTDEC	0.368	<0.001	Highly Significant
CASHMGT→DEBTPAY	0.196	<0.001	Highly Significant
CASHMGT→SOCBEN	0.229	<0.001	Highly Significant
LOANMGT→BMGTDEC	0.365	<0.001	Highly Significant
LOANMGT→DEBTPAY	0.310	<0.001	Highly Significant
LOANMGT→SOCBEN	0.187	0.001	Significant

*Significant at p<0.05

Table 5 presents a comprehensive analysis of the path coefficients and their significance levels, which underpin the hypothesis testing results. Significant-to-highly significant analysis is indicated by beta values ranging from 0.119 to 0.368. The endogenous variable, sustainable development, reflects the quality of strategic and operational choices made by the microentrepreneurs. Cash management shows the highest beta coefficient ($\beta = 0.368$, $p < .001$), suggesting that owners' mastery of daily cash flow is the primary driver of sustainable development, given management decisions. Loan Management also shows a strong positive impact ($\beta = 0.365$, $p < .001$). This implies that decisions are heavily influenced by how well the owners handle credit and debt obligations. Meanwhile, financial planning is found to be insignificant in business management decisions, suggesting that, for these microentrepreneurs, long-term planning does not dictate day-to-day management to the same extent as other factors. This result is consistent with the study by Akinyi and Jagongo (2020), which indicated that many small and medium enterprise owners rely mainly on cash flow conditions, present experiences, and short-term financial constraints rather than on long-term financial planning. It is also aligned with the study by Orlando et al. (2022), which emphasized that small- and medium-enterprise owners are more focused on operational costs, cash flow, and day-to-day operational results. It only means that the financial planning may not be the basis of their daily decision-making.

In general, the findings lead to the rejection of the null hypothesis, which posits no significant relationship between the extent of financial literacy and the level of sustainable development among microentrepreneurs, as a significant relationship exists overall, except for financial planning in business management decisions. The data reveal that cash management serves as the anchor of financial literacy for microenterprises, as it is the only variable that strongly and consistently predicts all three dimensions of sustainable development. While financial planning is often considered the most important skill, the structural model shows it is not relevant to management decisions in a microenterprise context. It is likely because microentrepreneurs operate in highly volatile environments where alertness to cash and loan management is more valuable than a strict plan. However, planning remains vital for structural sustainability, such as debt repayment and social impact. The study by Corpuz (2022) is relevant to the current study's results because it concluded that financial literacy directly influences the financial performance and sustainability of microenterprises. Corpuz's research showed that informed financial decisions can be made and favorable financial outcomes achieved through microentrepreneurs' financial knowledge, skills, and behaviors. The finding that cash management is the anchor of microenterprises aligns with Lamatao and Sanchez (2025), who examined the cash flow practices of microenterprises and found that effective cash flow monitoring and proper record-keeping significantly influence a business's profitability and sustainability.

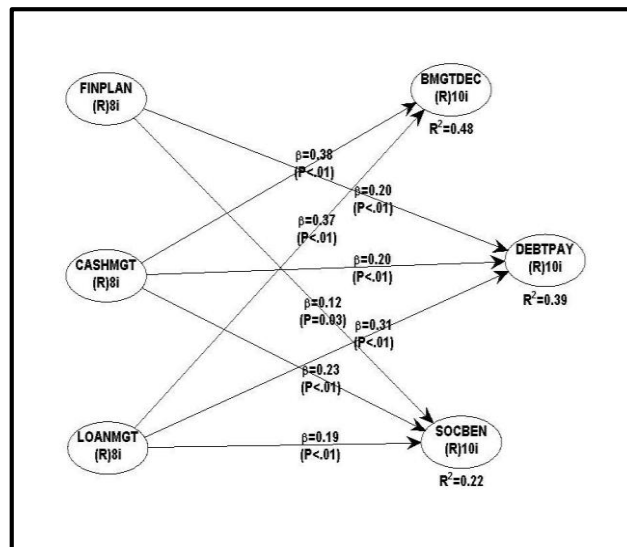


Figure 4. The Emerging Model of the Relationship Between Financial Literacy and Sustainable Development of Microentrepreneurs

In the context of the study, the emerging model in Figure 4 illustrates the direct structural relationships between microentrepreneurs' financial literacy and indicators of their sustainable development. Unlike the structural model, this new model indicates that all hypothesized paths are now statistically significant, suggesting a validated framework in which every dimension of financial literacy plays a distinct role. The emerging model presents path coefficients that represent the strength and direction of the effects, while the p-values confirm statistical significance. In terms of explanatory power, the model accounts for 48% ($R^2 = 0.48$) of the variance in management decisions, a robust finding in social science research. The three literacy factors also account for 39% ($R^2 = 0.39$) of the variance in debt payment performance. The model explains the impact on societal benefits, which accounts for 22% ($R^2 = 0.22$) of the variance. The emerging model provides a clear roadmap for enhancing the sustainability of microenterprises through targeted financial literacy.

Table 6
Standardized Estimates of the Path in the Emerging Model

Hypothesis	Standardized Estimates (β)	Standard Error	p-value*	Effect Coefficient**	Effect Size
Ho: Financial Literacy→Sustainable Development					
FINPLAN→DEBTPAY	0.204	0.060	<0.001	0.105	Small
FINPLAN→SOCBEN	0.119	0.061	0.026	0.041	Small
CASHMGT→BMGTDEC	0.378	0.059	<0.001	0.245	Medium
CASHMGT→DEBTPAY	0.196	0.061	<0.001	0.109	Small
CASHMGT→SOCBEN	0.229	0.060	<0.001	0.100	Small
LOANMGT→BMGTDEC	0.368	0.059	<0.001	0.238	Medium
LOANMGT→DEBTPAY	0.310	0.059	<0.001	0.178	Medium
LOANMGT→SOCBEN	0.187	0.061	<0.001	0.078	Small

*Significant at $p \leq 0.05$

** Effect size coefficient: 0.02 – small, 0.15 – medium, 0.30 – large

Based on Table 6, which presents the standardized path estimates in the emerging model, the results reveal how financial literacy dimensions affect the sustainable development of microentrepreneurs. The model evaluates the influence of the exogenous variables (FINPLAN, CASHMGT, LOANMGT) on three endogenous dimensions of sustainable development. Notably, all tested paths are statistically significant ($p < 0.05$). Cash management remains the strongest predictor of management decisions, with a standardized estimate of 0.378 ($p < .001$) and a medium effect size (.245), indicating that it is a primary contributor to the operational decisions of microentrepreneurs. Loan management shows a very similar influence with an estimate of 0.368 and a medium effect size (.238). Several studies explicitly supported these findings. One of these is the study by Haavig (2019). This qualitative multi-case study explores the cash management strategies small tavern business owners use to ensure the longevity of their businesses. The study highlighted that cash management strategies benefit not only

businesses but also the community by creating jobs, improving the local economy, and raising the standard of living, all of which are indicators of sustainability. In addition, the World Bank and IFC (2024) highlighted the importance of loan management as a component of financial literacy, as it affects an enterprise's ability to remain in business and continue operating over time.

Regarding the impact on debt payments, loan management is the primary factor, with a beta estimate of 0.310 and a medium effect size of 0.178. Both financial planning (0.204) and cash management (0.196) show small effect sizes (.105, .109). This suggests that while planning and cash flow help, technical loan management is the most decisive factor in successfully paying off debt. Several aspects of loan management greatly affect the effectiveness of debt payment. However, the very first step in effective loan management is identifying the right loans for the business. It also includes the knowledge of what financial institutions offer good interest rates. According to the Global Partnership for Financial Inclusion (2024), informal lending channels often have higher interest rates than banks. Endris (2022) found that limited knowledge of loan products is associated with receiving less favorable credit, making it harder for microenterprises to achieve sustainability. Another important part of loan management is comparing loan terms, including interest rates, amortization schedules, and collateral requirements. Lusardi (2019) found that those who understood debt better were less likely to borrow money at high interest rates and better able to plan their repayments around their cash flow. Kaiser (2024) further stressed that understanding the terms of a loan immediately lowers the risk of becoming over-indebted. Regarding societal benefits, cash management again leads this dimension, with an estimated effect size of 0.229, though it is considered small. Financial planning and loan management both show significant positive correlations with societal benefits, though their effect coefficients are the lowest in the emerging model.

The emerging model confirms the rejection of the null hypothesis for all eight paths, as all p-values are below the 0.05 threshold. The standard error across all paths is consistently low, ranging from 0.059 to 0.061, indicating high precision in these estimates and increasing the model's reliability. Overall, cash and loan management are functional factors in the sustainable development of microentrepreneurs. This implies that their management skills are fundamental to their business's survival. This is in line with the study by Cabildo et al. (2022), which found that cash management is positively related to financial performance, including higher profitability. Like cash management, loan management is also vital to maintaining financial health (Bancoro, 2023).

Table 7
Proposed Financial Literacy Program for Microentrepreneurs

Program Component	Objective	Strategies/ Activities	Timeline	Personnel Responsible	Success Indicator	Estimated Budget
1. Financial Literacy Assessment and Profiling	To determine the current level of financial knowledge and financial practices of microentrepreneurs.	Conduct baseline financial literacy surveys and structured interviews focusing on financial planning, cash management, and loan management practices.	Q1 2027	Municipal Planning and Development Office (MPDO), Municipal Business Office, Partner Academic Institution	100% of participating microentrepreneurs were assessed, and a baseline financial literacy profile was established.	₱40,000.00
2. Cash Management Training Workshop	To strengthen the ability of microentrepreneurs to manage cash flow and daily financial transactions.	Conduct training sessions on cash flow monitoring, proper cash allocation, income segregation, receivables management, and basic bookkeeping practices.	Q1–Q2 2027	MPDO, Department of Trade and Industry (DTI)-Negosyo Center	At least 80% of participants demonstrate improved cash management practices, according to the post-training evaluation.	₱90,000.00

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3. Financial Planning and Budgeting Seminar	To improve financial planning skills and strengthen financial preparedness among microentrepreneurs.	Facilitate seminars on budgeting, financial goal-setting, risk management, investment awareness, and the development of simple financial plans for business sustainability.	Q2 2027	MPDO, DTI-Negosyo Center	At least 75% of participants develop a basic financial plan and budgeting framework for their business.	₱80,000.00
4. Responsible Borrowing and Loan Management Training	To enhance the capability of microentrepreneurs to make informed borrowing decisions and manage loans effectively.	Provide training on loan evaluation, credit terms analysis, repayment planning, proper utilization of borrowed funds, and loan monitoring practices.	Q3 2027	MPDO, DTI-Negosyo Center, Microfinance Institutions, Local Banks,	At least 80% of participants demonstrate improved understanding of loan management and repayment planning.	₱70,000.00
5. Financial Mentoring and Monitoring Program	To ensure the continuous application of financial literacy skills in business operations.	Establish quarterly mentoring sessions, financial coaching, and monitoring of financial practices among participating microentrepreneurs.	Q3-Q4 2027	MPDO, DTI-Negosyo Center, Partner Academic Institution	At least 70% of participating enterprises show improvement in financial record-keeping and financial decision-making.	₱100,000.00
6. Financial Sustainability and Growth Forum	To reinforce financial discipline and promote sustainable enterprise growth.	Organize a forum featuring successful entrepreneurs, financial experts, and government support agencies to share best practices in financial management.	Q4 2027	MPDO, DTI-Negosyo Center	Increased awareness of sustainable financial practices among participants; positive evaluation from at least 85% of attendees.	₱60,000.00

This program emphasizes stages that begin with an assessment of microentrepreneurs' financial literacy, followed by targeted financial education, mentoring, and coaching. By establishing a baseline financial literacy profile, relevant government agencies can identify specific gaps in the financial knowledge, skills, and practices of microentrepreneurs (Morales, 2023). Assuming that improvements in financial literacy cannot be achieved through one-time training and seminars, the program includes mentoring and monitoring of microentrepreneurs' application of the financial knowledge they have gained. In addition to this study, this program was supported by various studies. One of these is Kurniasari's (2025) research, which demonstrated that financial literacy significantly improves entrepreneurs' financial management practices. Subsequently, these entrepreneurial practices directly influence sustainability and business performance. Moreover, the study by Culebro-Martinez et al. (2024) indicates that financial literacy strengthens entrepreneurs' ability to manage credit responsibly and make sound borrowing decisions that support business growth. In addition, knowledge-sharing initiatives have been recognized as an effective means of strengthening microentrepreneurs' competencies and financial behaviors (Pinca et al., 2023).

4. Conclusions

Based on the findings, the following conclusions are drawn: The essential components of financial literacy, such as financial planning, cash management, and loan management, require ongoing strengthening among microentrepreneurs to support the sustainable development of their businesses. The extent of financial literacy among microentrepreneurs: Microentrepreneurs have a strong ability to allocate resources for future investments and set financial goals to sustain the business, but long-term planning is not the basis of their daily business operations. Microentrepreneurs exhibit sound cash management practices, enabling them to manage their operational finances efficiently. Microentrepreneurs can effectively manage their business's financial obligations. At the level of sustainable development for microentrepreneurs, sound management decisions are widely practiced in business operations. Microentrepreneurs maintain creditworthiness to avoid financial distress. The microentrepreneurs are driven by a commitment to the community to build long-term sustainability rather than by a mere concern for short-term profits. There is a significant relationship between the extent of financial literacy and the level of sustainable development of microentrepreneurs, except for financial planning as related to business management decisions. Cash management serves as the anchor of financial literacy, leading to sustainability. Formulation and continuous implementation of a financial literacy program that includes evaluation, training, seminars, mentoring, and coaching can enhance microentrepreneurs' financial literacy and support their business sustainability.

Recommendations - Based on the study's findings and conclusions, the following recommendations are presented: Microentrepreneurs may be encouraged to engage in activities that strengthen their financial literacy, particularly in financial planning, cash management, and loan management. Even though the data showed they already possess a high level of financial literacy, continuous improvement in these areas remains essential to help them manage their business more effectively. Regarding the Extent of Financial Literacy of Microentrepreneurs, the LGU may collaborate with academic and financial institutions to conduct training for microentrepreneurs on long-term financial planning, including budgeting, to be incorporated into their daily operations. Microentrepreneurs may be encouraged to adopt formal cash control systems, such as cash flow monitoring and proper recording, to strengthen their cash management practices. A collaboration between financial institutions and the LGU may be encouraged to facilitate seminars for microentrepreneurs about loan management and repayment strategies. At the Level of sustainable development, microentrepreneurs may be encouraged to incorporate financial planning and forecasting into their daily decision-making. To maintain creditworthiness, microentrepreneurs may be encouraged to seek guidance from financial institutions about the loan products and repayment plans. Microentrepreneurs may strengthen programs and initiatives that promote community-oriented practices, ensuring their businesses contribute to the community's long-term socio-economic development. LGU, in collaboration with academic and financial institutions, may prioritize cash management training as a core component of sustainability programs, and may also help microentrepreneurs apply financial planning to their business decisions through training and case-based learning. LGU and DTI may administer the financial literacy program for microentrepreneurs, covering the assessment, training, mentoring, and evaluation. They may also be encouraged to assign program coordinators to oversee implementation, monitoring, and continuous improvement. Future researchers may conduct further studies on financial literacy and the sustainable development of microentrepreneurs by incorporating additional variables, expanding to other locations, and using a larger sample size. This may provide deeper insights into the factors that affect the sustainability of microenterprises.

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Challenges, opportunities, and the role of fishermen in community development in San Jose, Occidental Mindoro

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Abstract

This study aimed to analyze the problems and potentials of the small-scale fishermen in San Jose, Occidental Mindoro and their role in community development. The study tackled the issue of livelihood vulnerability arising from environmental degradation, inadequate technical resources, and a lack of economic opportunities, which affects fishermen's income and the welfare of the coastal community. The research design used was the sequential exploratory. Quantitative data were collected from 349 fishermen by means of structured questionnaires. The challenges were measured using indicators based on economic, environmental, and technical aspects, whereas the opportunities were measured using business, social, and government aspects, with weighted mean scores. The researcher also investigated the level of fishermen's participation in community development processes to ascertain their role in improving the quality of life and local economic development. Fishermen faced few challenges overall, with economic issues being the least, followed by environmental and technical concerns. Social opportunities were the strongest, reflecting good family support and community cooperation. Community participation was moderate, with greater contributions to quality of life than to economic opportunities. The study concluded that productivity, resilience, and income stability could be increased through improvement of technical capacity, the broadening of business programs, and the provision of government support. Improving skills, business opportunities, and government support can enhance their productivity and sustainability.

Keywords: small-scale fishermen, community development, fishermen's livelihood sustainability, quality of life, and local economic development

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1. Introduction

The Philippines, an archipelagic nation, has consistently depended on its productive fishing waters, with a coastline stretching 36,289 kilometers (Bureau of Fisheries and Aquatic Resources, 2022). Fishing has been an integral part of Filipino life since ancient times, influencing not only their diets but also their trade systems and cultural traditions. Moreover, for generations, coastal communities have relied on the sea as their primary source of food and livelihood. As a result, fishing continues to be an essential contributor to the nation's economy today. In fact, according to the World Bank (2023), fisheries contributed 1.3% to the national Gross Domestic Product (GDP) and provided direct employment to more than 1.6 million fisherfolk. The Philippines also ranks among the top ten largest fish producers worldwide, supplying both domestic consumption and international markets with tuna, sardines, and other high-value species (Food and Agriculture Organization, 2020), as the fish remains a staple food for millions of Filipinos, accounting for over 22 kilograms per capita annual consumption (PSA, 2022). Despite its importance, the fishing industry continues to face mounting challenges, including overfishing, illegal and unregulated fishing, the destruction of coral reefs and mangroves, and the impacts of climate change, all of which have led to declining fish stocks. Studies indicate that most of the country's fishing grounds are already overexploited, posing significant threats to food security and the economic stability of fisherfolk (Bureau of Fisheries and Aquatic Resources, 2022). Most of the sector comprises small-scale fisherfolk who remain highly vulnerable, with many living below the poverty threshold due to declining fish stocks and restricted access to markets (World Bank, 2023). The consequences extend beyond economic losses. The degradation of marine resources undermines cultural traditions, social cohesion, and the long-standing relationship between Filipino communities and the sea. These intertwined challenges highlight the urgency of balancing resource use and sustainability. As such, this research aimed to understand better the complex issues affecting the fishing industry and the coastal communities that depend on it, while also exploring opportunities for sustainable development, resilience, and community empowerment.

The municipality of San Jose, Occidental Mindoro, is one of the coastal towns blessed with rich marine resources. Its fisheries support both local markets and the broader economy (Asio et al., 2023). However, for the people of San Jose, fishing is more than a source of income—it is a way of life. Families depend on the sea for daily sustenance, while its biodiversity provides opportunities for commerce, food security, and community stability. Despite its importance, fishing in San Jose is not without challenges. Fisherfolk often face unstable market prices, outdated fishing gear, dwindling fish stocks, and limited government support. Unpredictable weather and rising fuel costs further burden their livelihoods, making daily survival uncertain. These difficulties highlight the vulnerability of fishing communities and the urgent need for sustainable and inclusive solutions.

Alongside these struggles, opportunities also emerged from the initiatives of government, such as programs that distribute fishing boats, nets, promotion of sustainable practices like lambaklad fishing, and training programs offered by agencies and local congresses (Bureau of Fisheries and Aquatic Resources, 2023), which provide fisherfolk with better tools and knowledge to adapt to changing conditions. These opportunities, when maximized, can strengthen the fishing sector and uplift the lives of coastal communities. Most importantly, fishermen play a crucial role in community development, as their work sustains households, contributes to the local economy, and fosters social cohesion in coastal communities. Beyond livelihood as the main source of fishing, it also connects families to their cultural roots by helping them understand the challenges and opportunities they face, enabling fisherfolk to build resilient, thriving communities.

Statement of the Problem - This study aimed to identify the challenges, opportunities, and the role of fishermen in community development in San Jose, Occidental Mindoro. Specifically, it sought to answer the

following questions: 1. What are the challenges faced by the fishermen? 2. What are the opportunities available to the fishermen? 3. What is the extent of challenges faced by the fishermen in terms of: Economic aspect, Environmental aspect, and Technical aspect? 4. What is the level of opportunities faced by the fishermen in terms of: Business aspect, Social aspect and Government aspect? 5. What is the level of fishermen's role in community development initiatives in coastal areas in terms of: Quality of life and Economic opportunities? 6. Is the level of fishermen's role in community development initiatives in coastal areas significantly affected by challenges and Opportunities? 7. What intervention program may be proposed to enhance the fishermen's involvement and contribution to the community development?

Significance of the Study - This study is significant because it bridges the gap between the realities of fishing livelihoods and community development, emphasizing the importance of fishermen as contributors to both the economy and society of San Jose, Occidental Mindoro. The research examined the economic, social, and environmental factors affecting the small-scale fishing industry. For the coastal community, this study provides an avenue to recognize their contributions to local food security, economic stability, and cultural heritage, while also identifying the pressing issues affecting their well-being. For fishermen, this study is beneficial because it aims to directly address the primary challenges they face, such as limited government support, limited resources, insufficient income, and environmental risks, and its findings may also provide valuable information to improve their livelihoods. To government Agencies, the findings serve as an evidence-based foundation for designing responsive programs and policies that address the needs of fisherfolk, such as access to resources, livelihood diversification, and sustainable fisheries management. For fisheries and government agencies such as the Bureau of Fisheries and Aquatic Resources (BFAR), these results can be used to strengthen support services, training programs, and sustainable fisheries management initiatives. To future researchers, this research contributes to the discourse on coastal livelihoods and community development, provides a reference for comparative studies in other fishing communities, and encourages further exploration of strategies that strengthen the role of fisherfolk in local development. Academic institutions, schools, and universities may use the findings as instructional material to enhance students' understanding of real-world issues in the fishing sector.

Scope and Delimitation of the Study - This study focused on the challenges and opportunities faced by fishermen in the barangays of Caminawit, Pag-Asa, Bubog, San Agustin, and Ilin Island in San Jose, Occidental Mindoro, and on their role in promoting community development. The economic aspect covered issues such as small fishing boats, low income, high fuel costs, income instability, and limited capital, which compromised their productivity and profitability. The environmental aspect included the condition of marine resources, the effects of weather, and sustainability practices, which resulted in fewer fish being caught in local fishing. The technical aspect explored the fishermen's limited knowledge of modern fishing and their lack of modern equipment, relying on old gear.

In addition, the study identified opportunities for fishermen in various areas. The business aspect included fishing as the primary source of income, the potential value of catches, and other entrepreneurial activities related to fish processing. The social aspect focused on community participation through knowledge sharing, food as a resource, and family and peer support among fishermen. The Government aspect considered partnerships with non-governmental organizations (NGOs) that provide training, equipment, and financial aid to fishermen. Data collection was limited to selected coastal barangays in San Jose and was conducted from August 2025 to March 2026. Other livelihoods, such as farming, trading, and aquaculture, were not addressed in the study. It applied only to small-scale and municipal fisherfolk, but not to large commercial fishing operators. It was limited to San Jose, Occidental Mindoro, and thus the results might not apply to other municipalities and provinces. Moreover, this research focused on current issues and opportunities and did not aim to provide a history or forecast of fisheries trends.

2. Methodology

Research Design - This study used an exploratory-sequential design with a mixed-methods approach

combining qualitative and quantitative methods. According to Creswell and Creswell (2018), a mixed-methods design is an approach in which the researcher collects and analyzes both qualitative and quantitative data to provide a comprehensive understanding of the role of fishermen in community development, despite the challenges and opportunities it faces. In this research, the qualitative phase was conducted first to explore and identify the major challenges and opportunities faced by fishermen in community development, and the insights obtained from interviews were used to develop the quantitative instrument for the survey phase. The themes guided the development of the structured survey questionnaire for the quantitative phase. The subsequent quantitative phase enabled the researcher to measure and describe the extent of these challenges and opportunities and to analyze the fishermen's contribution to community development using statistical methods.

Respondents of the Study - For the qualitative data, the respondents of this study consisted of 19 registered fishermen who resided and operated in the barangays of Caminawit (3), Pag-asa (4), Bubog (4), San Agustin (4), and Ilin Island (4) in the Municipality of San Jose, Occidental Mindoro. These coastal areas are among the primary fishing communities in the municipality and are, therefore, representative of the local fishing population of three thousand seven hundred sixty-nine (3,769). The respondents were selected using stratified random sampling, ensuring that participants have relevant knowledge and experience in fishing practices and community livelihood. The sample size of three hundred forty-nine (349) was computed using the Raosoft calculator with a 5% margin of error and 95% confidence level, ensuring an adequate number of participants to represent the total population of fishermen in the selected barangays for the qualitative data. The distribution of respondents across the selected barangays showed that Caminawit had the largest share, with 1,285 fishermen in the population and 119 respondents included in the sample. This was followed by San Agustin, which had 781 fishermen and 72 respondents. Ilin Island had a total of 749 fishermen, of whom 69 were selected as respondents. Bubog recorded 579 fishermen, with 54 respondents, while Pag-asa had the smallest population, with 375 fishermen and a corresponding sample of 35 respondents. Overall, the total population of fishermen across the five barangays was 3,769, from which 349 respondents were proportionally selected. This distribution reflects the application of stratified random sampling, ensuring that each barangay was adequately represented in the study.

Research Instrument - The researcher used two research instruments aligned with the exploratory-sequential design of the study: a semi-structured interview guide for the qualitative phase and a survey questionnaire for the quantitative phase. These instruments were used to collect data about the challenges, opportunities, and roles of fishermen in community development. During the qualitative phase, the researchers used a semi-structured interview guide to obtain in-depth insights from fishermen, allowing respondents to freely express their views on the difficulties they encountered and the opportunities they experienced. The information gathered from this phase was analyzed thematically and served as the foundation for developing the quantitative instrument.

For the quantitative phase, the researcher developed a structured survey questionnaire based on themes and insights generated from the qualitative results. The researcher-designed questionnaire was based on themes that emerged from interviews with fishermen, focusing on their challenges and opportunities in community development. The items were constructed after reviewing related literature and studies on fisheries, livelihood sustainability, and community participation to ensure relevance and content validity. The researcher developed the questionnaire into three parts. The first part focused on the challenges faced by fishermen, which were notably framed negatively to capture the difficulties respondents encountered. Consequently, these items were reverse-coded during data analysis to maintain consistency in the direction of interpretation. Through this process, higher scores uniformly indicate more favorable conditions (i.e., fewer challenges), while lower scores indicate greater difficulty. This approach enhanced the comparability and interpretability of the results across all variables in the study; the second part covered the opportunities of fishermen, both drawn from the qualitative themes. In contrast, the third part focused on the role of fishermen in community development and consisted of 48 items.

The questionnaire, in its initial stage, was presented to the adviser and a panel of experts from the (3) Graduate School of the Divine Word College of San Jose and (2) from Occidental Mindoro State College for validation. The validators assessed its clarity, relevance, and alignment with the research objectives. After incorporating all their

suggestions and recommendations, the researcher formulated the final version of the questionnaire. The researcher-made questionnaire underwent reliability testing through a pilot test with thirty (30) respondents outside the study area. The instrument's internal consistency was measured using Cronbach's Alpha. Results showed an acceptable reliability coefficient (above 0.70), indicating that the questionnaire was consistent and suitable for final data collection.

Table 1
Reliability Analysis Results

Items	Number of Items	Reliability Coefficients*	Analysis
I. Challenges for Fishermen			
A. Economic Aspect	6	.725	High Reliability
B. Environmental Aspect	6	.726	High Reliability
C. Technical Aspect	6	.771	High Reliability
II. Opportunities for Fishermen			
A. Business Aspect	6	.804	High Reliability
B. Social Aspect	6	.747	High Reliability
C. Government Aspect	6	.838	High Reliability
III. Role of Fishermen			
A. Quality of Life	6	.740	High Reliability
B. Economic Opportunities	6	.749	High Reliability

Table 1 shows that the instrument is highly reliable, as evidenced by the large coefficient of 0.838. The highest reliability coefficients are shown for the government aspect (.838) and the business aspect (.804), suggesting that the items in these sections are highly intercorrelated and provide a very stable measurement of their respective categories. Technical (.771) and social (.747) aspects, quality of life (.740), and economic opportunities (.749) development also demonstrate high internal consistency. While economic and environmental aspects recorded the lowest alpha of .725 and .726, respectively, these still fall within the acceptable threshold required for reliability. Based on the results, the instrument is highly reliable. Every scale surpassed the standard .70 Cronbach's Alpha benchmark, confirming that the survey items are internally consistent and suitable for further statistical analysis.

Data Gathering Procedure - Before the actual implementation of the study, the researcher requested formal approval from the research adviser and permission letters addressed to the barangay captains of Barangay Caminawit, Pag-asa, Bubog, San Agustin, and Ilin Island in the municipality of San Jose, Occidental Mindoro. For the qualitative phase, semi-structured interviews were conducted with fishermen in the target barangays, who were asked to answer the questions. The responses obtained provided a deeper understanding of the challenges and opportunities faced by the fishermen. For the quantitative phase, the survey questionnaire was personally handed to the registered fishermen, with its purpose and instructions clearly explained before they answered. Respondents were given one (1) week to answer the survey, after which the completed questionnaires were collected personally by the researcher. After the data collection, all responses were carefully checked for completeness and accuracy. The data were encoded, tallied, and analyzed statistically to determine frequencies, means, and relationships among variables. Throughout the entire process, the confidentiality and anonymity of all participants were strictly maintained. Before data collection, consent was secured from local authorities and respondents. Participants were informed of the study's purpose and assured of voluntary participation, anonymity, and confidentiality, and of their right to withdraw at any time. The study adhered to ethical principles and complied with the Data Privacy Act of 2012, and properly cited all sources in accordance with APA 7th edition guidelines.

Statistical Treatment of the Data - The qualitative data gathered from the semi-structured interviews were transcribed and subjected to thematic analysis. Common themes, patterns, and insights regarding the challenges and opportunities faced by the fishermen were identified. These themes served as the basis for formulating and refining the quantitative survey instrument. The qualitative findings were used to provide a deeper context and explanation for the quantitative results. In the quantitative phase, the researcher used weighted mean computation to describe the levels of challenges and opportunities, and the extent of fishermen's involvement and contribution to community development initiatives in coastal areas. Moreover, to determine the relationships among the three variables, the statistical software WarpPLS V7.0, designed for partial least squares (PLS) structural equation

modeling, was used.

Ethical Considerations - This study strictly adhered to ethical standards in conducting research. Before data collection, the researcher secured consent from local authorities and the respondents. Participants were fully informed about the purpose, scope, and voluntary nature of their participation. They were assured that their identities remained anonymous and that all information gathered was kept confidential and used solely for academic purposes. Respondents were given the right to withdraw from the study at any stage without any consequence. The research adhered to the ethical principles of respect for persons, beneficence, and justice, as outlined in the Publication Manual of the American Psychological Association (7th ed.; American Psychological Association, 2020). Furthermore, this study complied with the provisions of the Data Privacy Act of 2012 (Republic Act No. 10173) to ensure the protection of personal and sensitive information. Proper acknowledgment and citation of all literature, data sources, and references used in the study were provided in accordance with the APA 7th edition citation and referencing guidelines.

3. Results and Discussions

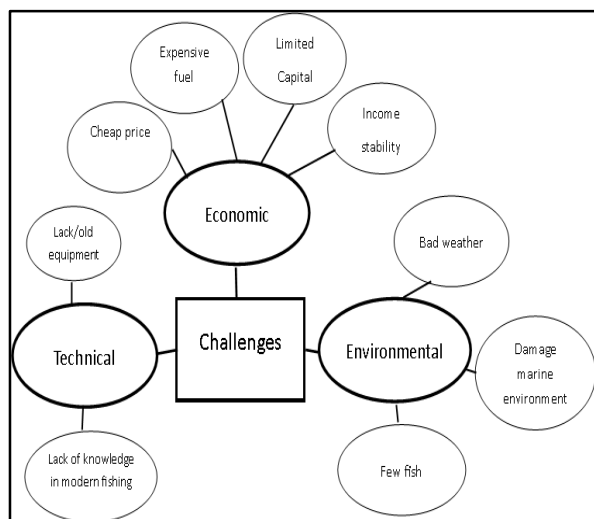


Figure 1. Initial Thematic Map of Challenges faced by the Fishermen

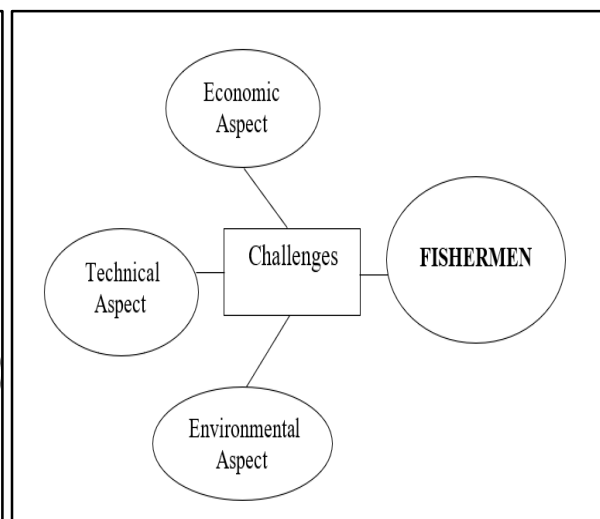


Figure 2. Final Thematic Map of Challenges faced by the Fishermen

Figures 1 and 2 present the qualitative responses of the respondents, which were analyzed using thematic analysis, involving recording, transcription, tabulation, and coding to identify emerging themes. The developed thematic map presents the sub-themes in rectangles, while the central focus, “Fishermen,” reflects the study's overall context, as informed by participants’ responses. A total of identified factors were grouped into two major themes: challenges and opportunities. Under challenges, three (3) main themes emerged: economic, technical, and environmental aspects. Economic challenges include low prices, high fuel costs, limited capital, and income instability. This supports the findings of Briones (2022) and Pomeroy and Andrew (2020), who emphasized that small-scale fishermen face financial constraints, unstable income, and limited market access. Technical challenges include a lack of or outdated equipment and limited knowledge of modern fishing, aligning with Cinner and Barnes (2018), who noted that technical skills enhance fishers’ adaptive capacity. Environmental challenges involve bad weather, declining fish supply, and damage to the marine environment, which are consistent with studies highlighting the impact of climate variability and environmental degradation on fisheries productivity (Food and Agriculture Organization, 2020; Islam et al., 2022), as well as reports of weather-related disruptions in coastal communities (Philippine Information Agency, 2025).

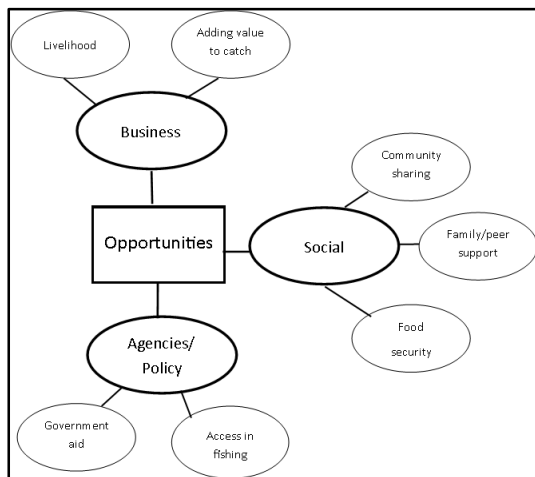


Figure 3. Initial Thematic Map of Opportunities faced by the Fishermen

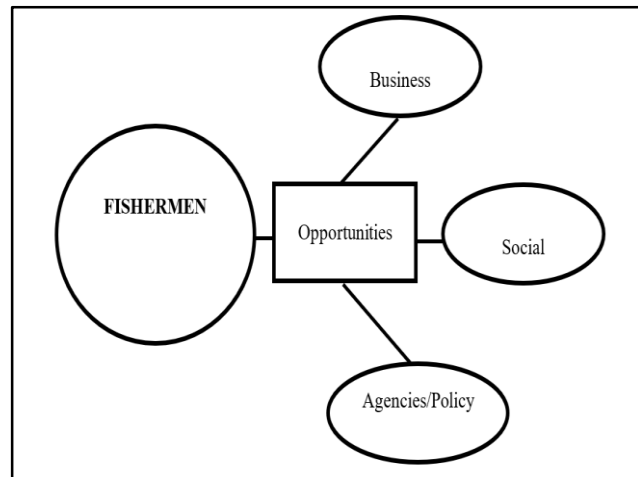


Figure 4. Final Thematic Map of Challenges faced by the Fishermen

On the other hand, opportunities were categorized into three (3) main themes, as presented in Figures 3 and 4: business, social, and government aspects. From a business perspective, opportunities include livelihood diversification and value addition to catch, which contribute to improved income stability and economic resilience (Department of Trade and Industry, 2023). Moreover, integrating technology in fisheries marketing enhances coordination and ensures fairer pricing (George, 2019). In terms of the social aspect, opportunities arise from community sharing, food security, and family or peer support. These are supported by the Southeast Asian Fisheries Development Center (2024), which emphasized the importance of collaboration and capacity-building, and by Cinner and Barnes (2018), who highlighted that strong social capital improves adaptive capacity. Under agencies and policy, opportunities include government aid and access to fishing resources. Programs such as the National Plan of Action for Small-Scale Fisheries and government support initiatives, including subsidies and livelihood assistance, play a vital role in improving fishers' productivity and resilience (Salas et al., 2019).

Table 2 presents the mean scores for the extent of challenges faced by fishermen across economic, environmental, and technical aspects. It should be noted that the statements were reverse-coded; therefore, although the original statements were negatively stated to describe challenges, the resulting mean scores reflect the absence or lesser extent of challenges. This means that lower mean scores indicate that respondents generally face significant challenges in their fishing activities. The overall composite mean for all challenge indicators is 2.38, interpreted as Low (1.80–2.59), which indicates that fishermen generally experience a high level of challenges in their fishing activities. This suggests that difficulties related to financial stability, environmental sustainability, and technical support continue to affect their livelihood and productivity.

Thus, rising operational expenses and limited access to financial resources reduce fishermen's income and affect their ability to sustain daily fishing activities (Food and Agriculture Organization, 2020; World Bank, 2023). Although some fishermen engage in supplemental livelihoods, these remain insufficient to ensure long-term financial stability (Roscher et al., 2022). Environmental challenges were also observed, particularly regarding participation in sustainability programs and marine habitat protection. The moderate mean scores for "I do not help protect marine habitats" (2.79) and "I rarely attend programs for sustainable fishing" (2.86) suggest that environmental awareness and conservation practices still need improvement. Limited participation in such programs may reduce the adoption of responsible fishing methods and affect the long-term sustainability of fisheries (Cinner et al., 2018; FAO, 2022). However, the low mean of 1.92 for "Bad weather affects my fishing trips" indicates that fishermen may have already adapted to local weather conditions and do not strongly perceive climate as their primary concern. Overall, the results reveal that economic challenges remain the most serious issue

faced by fishermen, followed by technical difficulties and environmental concerns. These findings highlight the need for stronger government intervention, livelihood diversification programs, continuous technical training, and the promotion of sustainable fishing technologies to improve fishermen's productivity, resilience, and contribution to responsible fisheries management (Allison et al., 2020; Garcia & Ocampo, 2022).

Table 2

Mean Extent of Challenges faced by the Fishermen in terms of Economic, Environmental, and Technical Aspects

Challenges	Weighted Mean*	Interpretation
Economic Aspect		
1. I have difficulty obtaining funds for my fishing activities.	2.04	Low
2. High operational costs, such as fuel, fishing equipment, and labor, reduce my income.	1.80	Low
3. My income changes because my fish catch is not always the same.	1.81	Low
4. I do not get a fair price for my fish	2.13	Low
5. What I earn from fishing is not enough for my family.	2.10	Low
6. I have no other source of income aside from fishing to support my livelihood.	2.07	Low
Composite Mean	1.99	Low
Environmental Aspect		
1. There are fewer catches now compared to before.	2.07	Low
2. I do not use sustainable methods to fish.	2.53	Low
3. Bad weather affects my fishing trips.	1.92	Low
4. I do not follow seasonal fishing bans or closed seasons.	2.48	Low
5. I do not help protect marine habitats.	2.79	Moderate
6. I rarely attend programs for sustainable fishing.	2.86	Moderate
Composite Mean	2.44	Low
Technical Aspect		
1. I lack access to modern fishing equipment that helps increase my catch.	2.35	Low
2. I rarely receive training on improved fishing techniques from the community or government.	2.60	Moderate
3. I am not familiar with using new technologies (e.g., GPS, fish finder, weather apps) to improve fishing efficiency.	2.67	Moderate
4. Our community does not have access to technical support related to fisheries development from the local government.	2.59	Low
5. I am not able to apply environmentally friendly fishing methods.	3.25	Moderate
6. Technical programs in our community have little effect on improving fishermen's skills.	2.76	Moderate
Composite Mean	2.70	Moderate
Overall Mean	2.38	Low

Legend: 4.20-5.00 Very High; 3.40-4.19 High; 2.60-3.39 Moderate; 1.80-2.59 Low; 1.00-1.79 Very Low *Reverse Coded

Table 3

Mean Extent of Opportunities faced by the Fishermen in terms of Business, Social, and Government

Opportunities	Weighted Mean*	Interpretation
Business Aspect		
1. I can grow small fish-related businesses.	3.23	Moderate
2. I can improve my earnings through creative fish processing, drying, or marketing.	3.40	High
3. There is good demand for fish in the local market.	3.38	Moderate
4. Cooperatives help me improve my income.	3.15	Moderate
5. I attend business related trainings to improve my business.	2.74	Moderate
6. Working with local businesses increases my earning opportunities.	3.20	Moderate
Composite Mean	3.18	Moderate
Social Aspect		
1. I support other fishermen in my community.	3.67	High
2. My family supports my fishing work.	4.20	Very high
3. Community groups provide information related to sustainable fishing.	3.11	High
4. I take part in groups to share knowledge, learn from others, and support collective problem-solving.	2.97	Moderate
5. I work with other fishermen to improve our community.	3.45	High
6. People in the community acknowledge the importance of fishermen.	3.92	High
Composite Mean	3.55	High

Government Aspect		
1. Local government provides support for fishing livelihood.	2.81	Moderate
2. Government programs help me understand sustainable fishing.	3.15	Moderate
3. I attend seminars to improve my skills.	2.75	Moderate
4. Government-provided tools help me fish more effectively.	3.04	Moderate
5. Rules and policies help improve my welfare as a fisherman	3.40	High
6. I can share my ideas in community or government meetings.	2.99	Moderate
Composite Mean	3.02	Moderate
Overall Mean	3.25	Moderate

Legend: 4.20-5.00 Very High; 3.40-4.19 High; 2.60-3.39 Moderate; 1.80-2.59 Low; 1.00-1.79 Very Low

Table 3 presents the mean scores for the extent of opportunities available to fishermen across business, social, and government aspects. The overall composite mean is 3.25, interpreted as Moderate (2.60–3.39), indicating that fishermen experience a moderate level of opportunities to improve their livelihoods and participation in community development. This suggests that while opportunities are present, additional support, stronger institutional assistance, and more sustainable development programs are still needed to maximize these benefits (Penca et al., 2021; George, 2019). Among the three dimensions, the social aspect emerged as the strongest source of opportunity, with indicators reflecting high to very high levels of support. Statement number 2, interpreted as Very High, indicates that family support is the most significant opportunity experienced by fishermen. This shows that family members play an important role in motivating fishermen, assisting in fishing activities, financial management, and decision-making. Strong family support systems contribute significantly to resilience, well-being, and sustainability in small-scale fishing communities (Food and Agriculture Organization, 2022; Allison et al., 2020). Similarly, items 1, 5, and 6 received High interpretations, showing that social relationships, cooperation, and community recognition provide valuable support for fishermen’s livelihoods. These findings support studies showing that strong social capital improves cooperation, resource accessibility, and adaptive capacity among fishing communities (Cinner et al., 2018; Bennett et al., 2021; Manlosa et al., 2023).

In terms of business opportunities, the statement “I can improve my earnings through creative fish processing, drying, or marketing” obtained the highest weighted mean of 3.40, interpreted as High. This indicates that fishermen recognize value-adding activities, such as fish processing, drying, and marketing, as important opportunities to increase income. Fisheries-based enterprises and value-added activities have been shown to strengthen income generation and economic stability in small-scale fishing communities (FAO, 2022; Penca et al., 2021; George, 2019). Likewise, item no. 1 also shows that market participation and small enterprise development offer moderate livelihood opportunities for fishermen. However, item no. 5 is interpreted as Moderate, indicating that although business opportunities exist, access to entrepreneurial training remains limited. This suggests that fishermen may not fully develop the skills needed to manage fisheries-related enterprises effectively. Limited participation in training programs can reduce their ability to diversify income sources and improve financial stability. The Philippine Institute for Development Studies (2021) emphasized that strengthening entrepreneurial training and capacity-building programs can significantly improve business development among fishing communities. Government-related opportunities also received mostly Moderate interpretations, suggesting that government programs and institutional support are present but may not be fully utilized by fishermen.

Meanwhile, “Rules and policies help improve my welfare as a fisherman” received a High mean of 3.40, showing that supportive policies positively influence fishermen’s welfare and livelihood security. This implies that although programs, policies, and training opportunities are available, stronger implementation and accessibility are still needed. Government support through fisheries programs, technical assistance, and livelihood development projects has been shown to improve access to resources, diversify income, and strengthen community resilience (BFAR, 2023; Salas et al., 2019). Overall, the findings reveal that fishermen have moderate opportunities, with social relationships serving as the strongest source of support, followed by business opportunities and government assistance. Family support, community recognition, and cooperation among fishermen significantly contribute to the sustainability of livelihoods, while value-added activities and participation in local markets strengthen economic opportunities. However, expanding government support programs, improving business-related training,

and strengthening community-based participation remain necessary to enhance further fishermen's productivity, resilience, and long-term livelihood sustainability (World Bank, 2023; Cinner & Barnes, 2018).

Table 4

Mean Level of the Fishermen's Role in Community Development Initiatives in terms of Quality of Life and Economic Opportunities

Role in Community Development Initiatives	Weighted Mean*	Interpretation
Quality of Life		
1. I join community activities to protect the sea and coast.	3.53	High
2. I teach others to fish responsibly.	3.42	High
3. I attend local meetings about fishing and livelihood	3.11	Moderate
4. I share my knowledge with other fishermen.	3.36	Moderate
5. I cooperate with other fishermen to help the community.	3.43	High
6. My fishing helps improve the community.	3.79	High
Composite Mean	3.44	High
Economic Opportunities		
1. My fishing provides enough income to support my family's daily needs.	3.28	Moderate
2. My livelihood provides opportunities to earn and support the community.	3.54	High
3. I can save money from my fishing activities for future needs.	3.02	Moderate
4. I can purchase better equipment or technology to increase my fishing income.	2.96	Moderate
5. Fishing provides stable economic opportunities compared to other livelihood options.	3.34	Moderate
6. I have access to financial support or credit to improve my fishing activities.	3.09	Moderate
Composite Mean	3.21	Moderate
Overall Mean	3.33	Moderate

Legend: 4.20-5.00 Very High; 3.40-4.19 High; 2.60-3.39 Moderate; 1.80-2.59 Low; 1.00-1.79 Very

Table 4 presents the mean level of the fishermen's role in community development initiatives with respect to quality of life and economic opportunities. The overall composite mean is 3.33, interpreted as Moderate (2.60–3.39), indicating that fishermen demonstrate a moderate level of participation and contribution to community development. This suggests that while fishermen actively support their communities through livelihood activities, environmental participation, and cooperation, there is still room to strengthen their involvement in formal decision-making, financial stability, and long-term economic development. Regarding quality of life, the findings show that fishermen play an important role in improving community welfare and environmental sustainability. Item no. 6 interpreted as High, indicating that fishermen recognize their livelihood as a significant contribution to community development. Fishing activities support food security, household income, and the local coastal economy, which strengthens the overall welfare of the community. This supports the findings of the Food and Agriculture Organization (2022) and Bennett et al. (2021), which emphasized that small-scale fisheries play a vital role in maintaining food supply, employment, and social welfare, particularly in developing countries. These findings indicate that fishermen contribute not only through income generation but also through environmental conservation, knowledge sharing, and cooperation with fellow fishermen. Community participation and shared responsibility are important factors in strengthening sustainable fisheries management and improving the quality of life in coastal communities (Cinner & Barnes, 2018).

On the other hand, item no. 3, interpreted as Moderate, suggests that fishermen may be less involved in formal governance and decision-making. Although they recognize their role in community development, participation in official meetings and planning processes remains limited. This may be due to time constraints, lack of information, or limited opportunities to influence decisions. Studies suggest that stronger fisherfolk participation in local governance improves sustainable fisheries management and community development outcomes (Allison et al., 2022; Pomeroy & Andrew, 2020). In terms of economic opportunities, the findings also indicate a moderate level of contribution, showing that fishing provides livelihood support, but financial limitations remain a concern. The indicator in item no. 2, interpreted as High, reflects that fishermen view their livelihood as an important contributor to the local economy. Fishing supports food supply, local trade, and income generation, which helps sustain other economic activities in coastal communities. The Food and Agriculture Organization (2022) highlighted that small-scale fisheries are essential for employment, food security, and poverty reduction, especially in developing countries. Conversely, item no. 4, interpreted as Moderate, indicates limited access to financial resources needed

for technological improvement. This suggests that fishermen face difficulties investing in better fishing tools and equipment due to insufficient capital, unstable income, and limited access to credit. Without adequate financial support, productivity and income growth remain constrained. Research in the Philippines shows that many small-scale fishers continue to rely on traditional fishing methods due to limited access to facilities, financial assistance, and modern equipment (Atillo, 2024).

Overall, the findings reveal that fishermen play a moderate role in community development initiatives, with stronger contributions to livelihood support, environmental participation, and cooperation than to formal governance and financial advancement. Their role in supporting food security, social welfare, and local economic stability is evident; however, stronger government support, improved access to financial resources, and greater participation in community planning are needed to maximize their contribution to sustainable community development (Bennett et al., 2021; Coulthard et al., 2020).

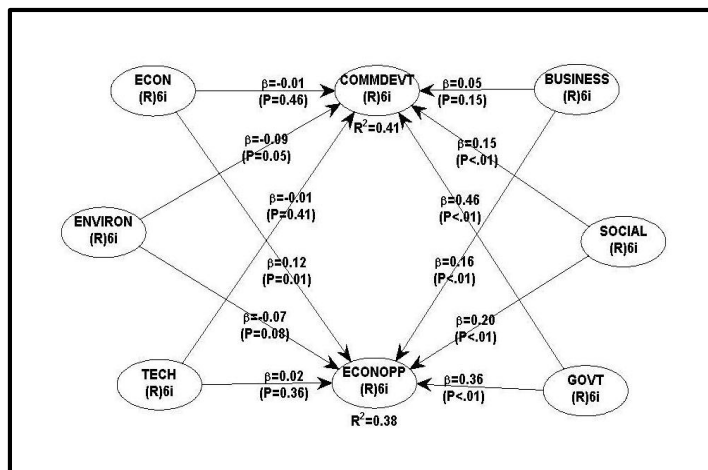


Figure 5. Structural Model of the Effect of the Fishermen's Challenges and Opportunities on their Role in Community Development Initiatives

The structural model in Figure 5 is analyzed to examine the relationships between the various challenges: economic (ECON), environmental (ENVIRON), and technical (TECH) faced by the fishermen, their opportunities in terms of business, social, and government (GOVT) aspects, and the impact on community development (COMMDEVT) in terms of quality of life and economic opportunities (ECONOPP). The model highlights the specific factors that contribute to fishermen's roles in community development initiatives. Beta coefficients indicating the strength of the relationships ranged from -0.01 to 0.46, reflecting varying degrees of association between the exogenous and endogenous variables. These are supported by significance levels ranging from .46 to less than .01.

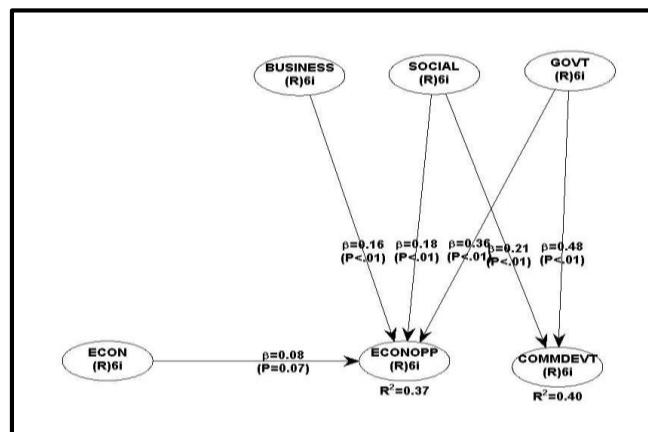


Figure 6. Emerging Model of the Effect of the Fishermen's Challenges and Opportunities on their Role in Community Development Initiatives

The model demonstrates moderate to strong explanatory power for the endogenous variables, community development, and economic opportunities. Around 41% ($R^2=0.41$) of the variance in fishermen's roles in community development is attributable to the identified combination of challenges and opportunities, indicating a substantial impact on their level of involvement. The model explains 38% ($R^2 = 0.38$) of the variance in economic opportunities. The structural model confirms the role of economic opportunities and social factors in increasing fishermen's role in coastal community development. Environmental challenges act as a significant barrier.

The structural analysis led to the model in Figure 6, which refines the relationships among the challenges faced by the fishermen, their opportunities, and the fishermen's role in coastal community development. This new model focuses on the most significant predictors, highlighting how institutional and social support systems influence both economic opportunities (ECONOPP) and community development (COMMDEVT) with respect to quality of life. The combined business, social, and government factors in the emerging model account for 37% ($R^2 = 0.37$) of the variance in fishermen's economic opportunities. A significant surprise from the emerging model is the pathway toward community-level impact driven by social and government factors, at 40% ($R^2=0.40$), which offers an alternative to improving fishermen's quality of life in coastal areas. The model explains 40% of the variance in the level of fishermen's roles in community development initiatives. Beta coefficients generally reflect positive values, as supported by the p-values. However, the path from economic challenges registered a p-value of .07; thus, a new model is presented for the final model.

Research using structural equation modeling (SEM) to assess the socioeconomic impacts of ecotourism development illustrates how endogenous latent constructs, such as employment opportunities, community participation, and resource-related impacts, are integrated into a structural model to better socioeconomic outcomes (Rasoolimanesh et al., 2019). Similarly, studies examining community-based poverty reduction initiatives have applied SEM to identify key factors influencing improvements in quality of life, showing that measured variables can explain a substantial portion of outcomes while also highlighting the role of latent or unobserved influences within structural models. These findings emphasize the importance of considering both observable and underlying factors in understanding community development processes. Furthermore, SEM provides a comprehensive framework for examining the complex relationships among social, economic, and environmental variables, enabling a more holistic analysis of factors that shape quality of life and community well-being (Hair et al., 2021). The model is well supported by research studies showing that institutional systems and social support networks are major catalysts for economic opportunities and community development in fisheries (Hamzah et al., 2024; de la Cruz et al., 2025). Instead of relying on personal earnings or technological improvements, these results show that phenomena such as cooperatives, government regulations, and communal administration play a significant role in maintaining long-term well-being and quality of life (Greenstreet et al., 2025; Hwang, 2022). The model's explanation of 37% of the variance in economic opportunities and 40% of the variance in community development involvement is statistically robust in the context of social-ecological research, indicating that external support structures are among the strongest leverage points for change (Wade, 2025). Moreover, the positive beta coefficients indicate that institutional support stabilizes economic opportunities, thereby increasing community involvement (Hamzah et al., 2024). Surprisingly, the hypothesis of a non-significant direct relationship between economic stress and community involvement ($p = .07$) is consistent with the contemporary resilience theory, as it implies that a high level of social capital and a sense of identity may still maintain participation in the case of financial strain (de la Cruz et al., 2025). In general, these results shift the development perspective towards reinforcing collective institutions and available resource networks, rather than the individual perspective on subsidies.

Table 5 presents the hypothesized relationships among the challenges faced by fishermen in the economic, environmental, and technological aspects; their perceived opportunities in the business, social, and government aspects; and their roles in community development initiatives, as described in terms of quality of life and economic opportunities for community development. The path coefficients (β) and p-values indicate the strength and statistical significance of these relationships.

Table 5*Path coefficients, p-value for H0*

Path	Beta (β) Coefficient	p-value*	Interpretation
Ho: Challenges→Fishermen's Role in Community Development Initiatives			
ECON→COMMDEV	-0.005	.462	Not Significant
ECON→ECONOPP	0.123	.010	Significant
ENVIRON→COMMDEV	-0.085	0.053	Not Significant
ENVIRON →ECONOPP	-0.075	0.079	Not Significant
TECH→COMMDEV	-0.012	0.410	Not Significant
TECH→ECONOPP	0.019	0.361	Not Significant
Opportunities→Fishermen's Role in Community Development Initiatives			
BUSINESS→COMMDEV	0.054	0.153	Not Significant
BUSINESS→ECONOPP	0.162	0.001	Significant
SOCIAL→COMMDEV	0.150	0.002	Significant
SOCIAL→ECONOPP	0.204	<.001	Highly Significant
GOVT→COMMDEV	0.458	<.001	Highly Significant
GOVT→ECONOPP	0.357	<.001	Highly Significant

*Significant at $p < 0.05$

About the effect of challenges on fishermen's role, economic challenges do not significantly influence their role in community development directly. However, they show a significant positive association with economic opportunities, suggesting that economic hardship may necessitate seeking new sources of income. Environmental challenges show a negative relationship with community roles, and this falls outside the standard 0.05 significance level. Technical-related challenges do not significantly affect either community roles or economic opportunities, indicating that technical gaps are not the primary contributors to this model, suggesting that the lack of advanced fishing technology is not the primary factor affecting their livelihood outcomes, because many small-scale fishermen continue to depend on traditional fishing knowledge, skills, and community-based practices that have been passed down through generations. These local practices allow them to sustain fishing activities even with limited access to modern equipment or technical training. Supporting this, a study of small-scale fishers in Malaysia found that about 60% still rely on traditional methods, such as observing waves, clouds, and wind conditions, to guide their fishing activities, even when modern technology is available (Yamin, 2025). The study revealed that most artisanal fishermen had 11–40 years of fishing experience, which contributes to their ability to sustain fishing activities and gradually adopt fishing practices. These findings imply that while modern technology may improve fishing efficiency, fishermen can remain engaged in community initiatives and generate income through their experience, adaptability, and shared knowledge.

Interestingly, opportunities emerged as the most powerful predictors of both economic stability and community involvement. Government support shows the strongest predictor in the model. Government initiatives have a highly significant positive impact on community development, including quality of life and economic opportunities. Social opportunities significantly enhance fishermen's roles in the community and are major drivers of economic opportunities. While business opportunities do not directly contribute to community development roles, they are significant drivers of improved economic opportunities.

The significant impact of government subsidies on fishermen's economic well-being and their roles in the community aligns with current findings in small-scale fisheries research. According to the FAO (2023), small-scale fisheries sustain the livelihoods of millions of families living on the coasts of various countries, and global governments must intervene through social protection programs, financial aid, and livelihood support to enhance fishermen's economic stability and overall well-being. Similarly, research by Stacety et al. (2021) highlights that livelihood programs and government-led interventions significantly improve economic opportunities and resilience in small-scale fishing communities. The study emphasized that partnerships between governments and local communities create opportunities that enhance fishermen's livelihood security and socio-economic development.

Social opportunities significantly improve fishermen's participation in community activities and increase their economic opportunities. Studies show that strong social relationships, cooperation, and knowledge sharing within

fishing communities help fishermen access resources, adapt to challenges, and improve their livelihoods. Reports from the Food and Agriculture Organization of the United Nations (2022) emphasize that social capital and community support systems play an important role in strengthening both community involvement and economic stability among small-scale fishermen. Although business opportunities do not significantly influence fishermen’s participation in community development, they play an important role in improving their economic opportunities. Activities such as fish trading, processing, and market access help fishermen increase their income and strengthen their livelihood. Anthon et al. (2024) argued that applying entrepreneurial marketing processes helped small-scale fishermen improve their financial performance by differentiating their products, creating value-added goods, and maximizing market opportunities. This, in turn, helped reduce poverty and improve economic outcomes.

The results for the path CHALLENGES→FISHERMEN’S ROLE fail to reject the null hypothesis, except for economic opportunities. The data does not provide enough evidence to say an effect exists since the p-value exceeded .05. Rejection of the null hypothesis for the path OPPORTUNITIES→FISHERMEN’S ROLE is identified, as they show a significant influence on the fishermen's role in community development or their economic opportunities, except for the business aspect on community development in terms of life quality. The model highlights a clear order of influence with government and social support as the primary channels for coastal community development. This suggests that policies focused on enhancing opportunities for fishermen are more effective than simply addressing their challenges. Studies showed that small-scale fishers maintain their participation in community activities despite operational challenges because fishing is deeply embedded in coastal social systems (World Bank, 2023). This suggests that although fishermen experience constraints such as limited resources, environmental changes, and technical limitations, they often remain active contributors to their communities due to strong social ties and livelihood dependence on fishing. In contrast, access to training, institutional support, and community networks enhances fishermen’s ability to improve their livelihoods and participate in community development initiatives (United Nations Development Program, 2022). Moreover, government programs and social support systems are key drivers of coastal community development, providing resources, capacity-building opportunities, and financial assistance that strengthen fishermen’s economic and social contributions.

Table 6
Intervention Program to Enhance the Fishermen's Involvement and Contribution to the Community Development

Intervention / Program	Key Activities	Duration	Rationale / Expected Outcome	Budget	Success Indicators	Responsible Person / Agency
Fisherfolk Registration, Organization, and Government Subsidy Access	Conduct barangay-level registration, strengthen fishermen associations/cooperatives, and facilitate access to government subsidy programs (e.g., fuel assistance, fishing gear support)	3–6 months	Ensures proper identification of beneficiaries, improves access to government assistance, and strengthens collective participation among fishermen	Php 100,000	At least 90% of local fishermen are registered, organized, and able to access government subsidy programs	Municipal Agriculture Office (MAO); Bureau of Fisheries and Aquatic Resources; Barangay Local Government Units (BLGUs)
Livelihood Support & Microfinance	Establish small savings groups and provide access to microloans for fishing gear and alternative livelihoods	6–12 months	Reduces dependence on intermediaries and improves financial resilience	Php 500,000	At least 70% of members access small loans; improved income stability	MAO; Department of Trade and Industry; Local Cooperatives

Skills Training & Value-Adding	Conduct training on fish drying, smoking, and basic processing methods	6–12 months	Provides alternative income and reduces waste during low catch periods	Php 300,000	At least 50% of participants adopt value-adding practices	Bureau of Fisheries and Aquatic Resources; Technical Education and Skills Development Authority; MAO
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The intervention program outlined in Table 6 is designed to enhance fishermen’s involvement in and contribution to community development through practical, community-based, and accessible strategies. At the institutional level, the program focuses on fisherfolk registration, organization, and access to government subsidies. By conducting barangay-level registration and strengthening fishermen’s associations, the program ensures that legitimate fishers are properly identified and can benefit from available government assistance, such as support for fuel and fishing gear. This approach improves coordination, inclusivity, and participation among fishermen while strengthening their connections with government agencies, such as the Bureau of Fisheries and Aquatic Resources, and local government units. This is supported by Fabinyi (2024), who emphasized that effective small-scale fisheries governance is essential for sustainability and must promote inclusive participation and the proper identification of stakeholders.

At the economic level, the program emphasizes livelihood support and financial inclusion through microfinance initiatives. The establishment of savings groups and access to small loans help reduce fishermen’s dependence on intermediaries and provide them with opportunities to improve their fishing operations or pursue alternative livelihoods. This enhances financial resilience and income stability among fishermen. This finding is supported by Wouters (2024), who highlighted that access to affordable credit and financial services is crucial for small-scale fishers to improve their livelihoods and strengthen their participation in fisheries value chains.

At the capability-building level, the program highlights skills training and value-adding activities. Through training on fish drying, smoking, and basic processing methods, fishermen are equipped with practical skills that enable them to increase the value of their catch, reduce waste, and generate additional income, especially during periods of low harvest. These initiatives are supported by agencies such as the Technical Education and Skills Development Authority and the Bureau of Fisheries and Aquatic Resources. This aligns with the study of Montojo et al. (2025), which stated that improving post-harvest practices and value-adding activities enhances product quality, reduces losses, and increases income opportunities for fisheries communities. Overall, the program integrates institutional support, financial assistance, and skills development to address the immediate needs of small-scale fishermen in remote island communities. By focusing on low-cost and sustainable interventions, the program aims to improve livelihood opportunities, strengthen community participation, and promote long-term contributions to community development.

4. Conclusions

Fishermen in San Jose, Occidental Mindoro, face a range of economic, environmental, and technical challenges that affect their participation in community development. Economically, rising operational costs, limited financial resources, and unstable income constrain their ability to sustain livelihoods. Although coping mechanisms exist, they remain insufficient to address financial instability fully. Environmentally, unpredictable weather patterns and changes in marine biodiversity moderately affect fishing activities; however, these challenges are generally manageable due to the fishermen’s resilience and adaptive strategies. From a technical perspective, limited access to modern equipment and sustainable fishing technologies continues to hinder efficiency and safety, highlighting the need for modernization despite their strong foundation in traditional methods. Overall, the extent of these challenges was interpreted as low across the three indicators. Despite these constraints, fishermen benefit from various opportunities that support their livelihoods and community engagement. Business opportunities such

as livelihood diversification, including fish processing, drying, and smoking, offer potential to increase income, although market participation and private-sector linkages remain underutilized. Socially, the fishing community demonstrates strong social capital, with close-knit relationships fostering cooperation, mutual support, and collective resilience. Government support is also present through policies, training, and financial assistance; however, more consistent and comprehensive interventions, particularly in infrastructure and funding, are needed to maximize impact.

Overall, the extent of available opportunities was assessed as moderate. In terms of community development, fishermen's overall perception of their role and participation was also interpreted as moderate. Active involvement in community initiatives contributes positively to their quality of life, enhancing well-being, security, and life satisfaction. While fishermen play a vital role in the local economy, their broader economic impact could be strengthened through improved access to diversified income sources and expanded market opportunities. Furthermore, strong social support systems within the fishing community, along with their contributions to local food security, are key drivers of economic opportunity and community development. These social bonds reduce reliance on individual income and limited technological resources, reinforcing collective progress. If properly implemented, the proposed interventions could enhance the involvement and contribution to community development.

Recommendations - Based on the findings and conclusions presented, the following recommendations are stated to address the challenges faced by fishermen and enhance their role and livelihoods. Programs may be developed to address the economic, environmental, and technical challenges faced by fishermen. Government agencies such as the Municipal Agriculture Office (MAO) and the Bureau of Fisheries and Aquatic Resources (BFAR) provide financial assistance programs, climate-adaptive fishing strategies, and access to modern fishing technologies and training to help fishermen improve productivity and reduce vulnerability to environmental and market fluctuations. Stakeholders such as government agencies, community organizations, and private partners may strengthen existing opportunities available to fishermen. Policies that ensure legal access to municipal waters, support cooperative development, and encourage partnerships with private markets may be continuously promoted to enhance fishermen's livelihoods and participation in community initiatives.

Since the overall extent of challenges faced by the fishermen across the three underlying indicators was interpreted as low, the following are recommended: In terms of economic aspect local government units and financial institutions may expand livelihood assistance programs, provide microfinance opportunities, and encourage supplementary income-generating activities to strengthen further fishermen's economic resilience and stability, Environmental management programs can be intensified through sustainable fishing practices, marine conservation training, and climate adaptation initiatives to help fishermen better respond to environmental changes and protect marine resources, and Technical Aspect in training institutions and fisheries agencies may provide capacity-building programs focused on modern fishing equipment, navigation technologies, and sustainable fishing techniques to improve operational efficiency and safety at sea. Since the overall extent of opportunities available to the fishermen across the three underlying indicators was interpreted as moderate, the following recommendations are forwarded: Business Aspect Government agencies and private sector partners may facilitate stronger market linkages, entrepreneurial training, and value-added processing opportunities to enable fishermen to diversify income sources and expand their economic activities, Social Aspect through community organizations may continue strengthening cooperative groups, peer networks, and collaborative community programs that encourage knowledge sharing, collective action, and community participation among fishermen, and government institutions may enhance the consistency and reach of support programs by improving financial assistance, infrastructure development, and training initiatives to increase the effectiveness of fisheries-related policies and services. Programs that support fishermen's participation in community development initiatives can be sustained to strengthen their contribution to local well-being and socio-economic development. Registered fishermen may be supported through social benefits such as government-subsidized health insurance and educational assistance for their children, especially for those actively involved in community-based coastal management and mangrove protection.

In terms of quality of life, community initiatives that promote health, social welfare, and family well-being may continue to involve fishermen, recognizing their role in strengthening household stability and overall community welfare—economic Opportunities. Local government units, such as the Department of Trade and Industry, may expand programs that promote income generation and market access. These initiatives may include value-added fish processing, entrepreneurial training, and direct market linkages to improve fishermen's livelihood opportunities and their economic contribution to the community. Since fishermen's participation in community development is largely opportunity-driven, programs may focus on strengthening social support systems, such as cooperatives, community networks, and collaborative initiatives, to encourage greater engagement in coastal development activities. The Municipal Agriculture Office (MAO), together with the Bureau of Fisheries and Aquatic Resources (BFAR), the Department of Trade and Industry (DTI), the Technical Education and Skills Development Authority (TESDA), and Barangay Local Government Units (BLGUs), may implement a coordinated approach to support fisherfolk programs. Priority should be given to the proper registration and organization of fishermen to ensure fair access to subsidies. Financial support through microfinance should be strengthened to improve income stability, while skills training and value-adding activities should be promoted to diversify livelihoods and reduce post-harvest losses. Future researchers may conduct similar studies in other coastal communities to compare the challenges and opportunities faced by fishermen. Additional variables such as education, access to technology, and climate resilience may also be explored to gain a broader understanding of fishermen's role in community development.

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Student Information and Accounting System (SIAS): In the school operations of the Divine Word College of San Jose

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Abstract

This study aimed to evaluate the use of the Student Information and Accounting System (SIAS) in school operations at Divine Word College of San Jose. The study employed an exploratory sequential design using a mixed method. In the qualitative phase, participants' responses were analyzed, and three major themes emerged, describing the difficulties experienced in using SIAS: accessibility, connectivity, and speed. These themes served as the basis for developing the survey instrument used in the quantitative phase. Quantitative data were collected from SIAS users, comprising college students, faculty members, and administrative staff. To determine the reliability of the instrument, Cronbach's alpha was applied. Statistical analysis was conducted using SPSS version 26 for descriptive statistics and WarpPLS version 7.0 for Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings revealed that, when reverse-coded, the overall extent of difficulties encountered by users was interpreted as high, indicating a high level of ease in system accessibility, connectivity, and speed. SIAS support for school operations was also interpreted as high in both system quality and school operational efficiency. Furthermore, the results showed that the difficulties encountered in using SIAS were significantly related to the quality and efficiency of school operations. Connectivity emerged as the most influential factor in school operations, while system speed significantly affected perceived system quality. The study recommended strengthening network connectivity, improving system processing speed, and enhancing back-end system stability to further the system's support for academic and administrative operations.

Keywords: Student Information and Accounting System, accessibility, connectivity, speed, school operations

Student Information and Accounting System (SIAS): In the school operations of the Divine Word College of San Jose

1. Introduction

A student information system is a digital tool that collects and gives access to detailed information about students (OECD, 2023). Having an information system in operations ensures the effectiveness and efficiency of an organization's performance (Paculaba, 2022). Information Systems make records easier to access and retrieve at any time, and they reduce the need for physical storage of hard copies. It increases efficiency and productivity, reduces errors, improves decision-making, and enhances adaptability. Beyond record-keeping, Information Systems can be used across various functions, particularly to support informed decision-making and evaluation.

In the modern era, integrating Information Systems into institutions such as schools is necessary to modernize administrative processes and improve academic services. According to Tomaro (2018), the integration of Information and Communication Technologies (ICT), including Information Systems, is essential in Philippine education, as it enhances both teaching and administrative functions. However, the success of this integration depends on how well the system addresses users' needs and expectations. The effectiveness of an information system is often determined by three critical factors: accessibility, connectivity, and speed. Accessibility ensures that students, faculty, and administrators can easily and reliably use the system regardless of time or location, promoting inclusivity in academic services (Fitria et al., 2024). Connectivity provides the technological foundation linking users and departments through stable internet access and real-time data exchange, enabling collaboration and data management (OECD, 2021). Speed, meanwhile, directly influences efficiency and user satisfaction by minimizing delays in enrollment, grading, and communication processes (DeLone & McLean, 2016). Together, these factors are essential in determining whether an information system can effectively support both academic and administrative operations.

The Student Information and Accounting System (SIAS) is a desktop and web-based platform developed by Digital Software Consultancy that offers integrated features for universities, colleges, and both private and government schools, including registrar, cashiering, budget, and accounting functions (Paculaba, 2022). As of September 2025, the Divine Word College of San Jose (DWCSJ) remains the only institution in the province that has acquired SIAS. The system primarily facilitates enrollment and accounting processes, providing efficient, convenient frontline services that meet the needs of students and clients. For students, this expansion enabled access to academic information, including activities, modules, examinations, grades, and statements of accounts. For faculty members, it provided functions such as uploading modules, encoding grades, and scheduling classes, thereby extending its utility to support both academic and administrative operations. This development reflects broader trends in Philippine higher education, where the pandemic significantly accelerated the adoption of digital technologies and learning management systems to sustain academic continuity (Goles et al., 2024). However, it is not enough for an organization to simply have an information system; it must address the needs of its end users. For students, it is important that the system provide up-to-date, reliable information, be accessible at any time, and remain easy to use. Since students depend on it for critical academic tasks, such as accessing grades, modules, and class schedules, the system must deliver accurate, timely information to support their learning and academic success. One factor that indicates the quality of an information system is its usability. Higher usability benefits most users, while poor usability can cause delays and limit potential improvements in both efficiency and service security (Kom & Kom, 2018).

Although existing studies have largely focused on assessing and evaluating Student Information Systems, little attention has been paid to the implications of incomplete implementation. In many cases, not all features of the system are fully developed or utilized, preventing it from reaching its full potential. This partial integration affects users by limiting accessibility, reducing efficiency, and constraining the quality of academic and

administrative services. Addressing this gap is crucial in understanding how the extent of system implementation influences user satisfaction and institutional performance. Seeing this necessity, the researcher, as a concerned user of the system, is prompted to conduct this study to examine the current status of the Student Information and Accounting System (SIAS) in terms of its accessibility, connectivity, and speed, as well as the difficulties encountered by its users at the Divine Word College of San Jose. This study further sought to analyze the system's current needs and propose an improvement plan to address them, thereby ensuring more effective and successful implementation.

Statement of the Problem - This study aimed to evaluate the use of the Student Information and Accounting System (SIAS) in the School Operations of the Divine Word College of San Jose. Specifically, the researcher sought to answer the following questions: (1) What are the difficulties encountered by the users of the Student Information and Accounting System (SIAS)? (2) What is the extent of the difficulties encountered by the users of the Student Information and Accounting System (SIAS) in terms of accessibility, connectivity, and speed? (3) What is the level of the Student Information and Accounting System (SIAS) in School Operations in terms of quality and efficiency? (4) Is there a significant relationship between the difficulties in using the Student Information and Accounting System (SIAS) and the level of school operations of SIAS in terms of quality and efficiency? (5) What improvement plan could be adopted to enhance the Student Information and Accounting System (SIAS) of the Divine Word College of San Jose?

Significance of the Study - The results of this study will greatly benefit the following individuals and institutions. For students, this study will help ensure that the Student Information and Accounting System (SIAS) is maximized to its full potential, providing reliable and accessible academic information without implementation gaps. With a more efficient system, they will be able to access grades, modules, activities, and statements of accounts in a timely and convenient manner, thereby supporting academic success. For parents, this study will provide timely and accurate updates on their children's records and transactions, supporting better monitoring and informed decision-making. For the faculty, the primary users of the system, their difficulties in utilizing the Student Information and Accounting System (SIAS) will be identified. Addressing these challenges will provide the necessary interventions, enabling them to use the system more effectively and efficiently in carrying out their academic and administrative responsibilities. Therefore, some of their manual tasks will be reduced, allowing them to focus more on instruction and student support. For the Administrative Staff, this study will help identify the challenges and concerns they face in using the Student Information and Accounting System (SIAS), enabling necessary adjustments. It will also lessen their paperwork and make their tasks easier to manage, improving their work performance. For the Divine Word College of San Jose, this study will help the school identify specific system gaps and operational issues that limit SIAS performance. The findings can support practical adjustments in system implementation, improve administrative workflow, and strengthen service delivery to students and parents. For educational institutions, this study will help them identify the strengths and weaknesses of the Student Information and Accounting System (SIAS). It will also serve as a guide for them in evaluating or enhancing their own information and accounting systems. For future researchers, this study will provide useful insights into the Student Information and Accounting System (SIAS). It can serve as a practical guide and reference as they continue or expand studies on information systems in schools, helping them build on what has already been learned.

Scope and Delimitation of the Study - This study focused on the difficulties encountered by the students, faculty, and administrative staff in using the Student Information and Accounting System (SIAS) in terms of its (a) accessibility, (b) connectivity, and (c) speed, and SIAS in School Operations in terms of (a) quality and (b) efficiency. Through this, the study aimed to identify the strengths and weaknesses of the Student Information and Accounting System and suggest ways to improve it. The respondents included randomly selected students from the second year to third year college from the Bachelor of Science in Accountancy, Bachelor of Science in Business Administration, Bachelor of Science in Information Technology, Bachelor of Science in Hospitality Management, Bachelor of Science on Secondary Education and Bachelor of Elementary Education, who were currently enrolled at the Divine Word College of San Jose, faculty members from Junior High School, Senior High School and College department and administrative staff who are users of the system. This study was limited to the Student

Information and Accounting System (SIAS) as it is used within the institution. It did not include other information systems from different schools or organizations. Likewise, it did not cover the technical aspects of programming or system development, but only how they were applied in academic and administrative operations. The coverage of this study was for the 2025–2026 academic year.

2. Methodology

Research Design - This research employed an exploratory-sequential design, combining qualitative and quantitative research. Results from the interview, which was the qualitative phase, provided direction for the quantitative phase, and qualitative results were used to validate the quantitative findings (Trochim et al., 2016). Descriptive research was used to measure the extent of difficulties respondents encountered when using the Student Information and Accounting System (SIAS). A descriptive correlational design was employed to measure the relationship between the independent and the dependent variables (Gravetter & Forzano, 2018).

Respondents of the Study - As determined by the Raosoft online sample size calculator for a population of 570, with a 5% margin of error and a 95% confidence level, the sample size is 230. However, 208 respondents were used in the final administration of the instrument. 22 respondents failed to submit the questionnaire on time; hence, they were not included. While this resulted in a slight increase in the margin of error to approximately 5.45%, the sample remains statistically reliable for this analysis. According to Hair et al. (2021), a sample size exceeding 200 is generally sufficient to maintain adequate statistical power and achieve stable results in structural equation modeling (SEM) and path analysis.

Research Instrument - For the qualitative phase, one (1) open-ended question was used. For the quantitative phase, the research instrument was a researcher-made questionnaire, which has two parts, the first part was the extent of difficulties encountered by the respondents in using the Student Information and Accounting System (SIAS) as per the result of the interview, namely, accessibility, connectivity, and speed, followed by the level of the Student Information and Accounting System (SIAS) in School Operations in terms of quality and efficiency as measured by the respondents. To measure the extent of difficulties in using the Student Information and Accounting System (SIAS) and the level of SIAS integration into school operations, the respondents were asked to rate each of the eight (8) statements regarding difficulties. These statements were interpreted using reverse coding, in which negatively worded items were recorded so that higher scores consistently indicate ease or the absence of difficulty. Additionally, ten (10) statements for school operations were evaluated by checking the box that corresponds to the level of agreement using the Likert Scale of Agreement.

Expert validity was used to assess the questionnaires' validity. It measured what was intended to measure, with the assistance of three (3) graduate school professors of the Divine Word College of San Jose, one (1) faculty member from the College of Information Technology, and one (1) Senior Tech Specialist from the Digital Software Consultancy company, to evaluate the applicability and appropriateness of the items in relation to the variable under investigation. The analysis used the Cronbach's Alpha measure, which was based on a sample of thirty (30) students from the Bachelor of Science in Information Technology who responded to the questionnaire once. The table below shows the result of the reliability analysis.

Table 1
Result of Reliability Analysis

Items	Number of Items	Reliability Coefficients*	Analysis
I. Extent of the Difficulties Encountered in Using SIAS (8 items each)			
A. Accessibility	8	0.864	High Reliability
B. Connectivity	8	0.922	Very High Reliability
C. Speed	8	0.880	High Reliability
II. Level of SIAS in School Operations (10 items each)			
A. Quality	10	0.896	High Reliability
B. Efficiency	10	0.851	High Reliability

*Based on standardized items

The results show the strongest internal consistency in connectivity (.922), while efficiency and accessibility, though reliable, exhibit greater variance in how individual items correlate with one another. A connectivity alpha of .922 suggests that the 8 items used to measure connectivity are highly interrelated and reliably measure the same underlying construct. All five scales fall within the high reliability range, demonstrating good to excellent internal consistency. Overall, the items within each scale measure their respective constructs consistently across the 30 respondents in the reliability procedure; thus, the instrument is consistent and suitable for further use in the study.

Data Gathering Procedure - For the qualitative phase, a semi-structured interview was conducted face-to-face with twenty-five (25) participants. The participants consisted of ten (10) third-year and ten (10) fourth-year Bachelor of Science in Business Administration students, along with five (5) faculty members, to uncover the difficulties encountered by the respondents. The interview lasted seven days. The proponent devised a coding technique, and responses were transcribed for initial and final thematic analysis. For the quantitative part, a questionnaire was used. A face-to-face survey was conducted, and the researcher completed it in 13 days. The results were tabulated, analyzed, and interpreted by the proponent, with guidance from the statistician and her adviser. In line with RA 10173, otherwise known as the Data Privacy Act of 2012, the researcher did not disclose any information gathered in this study. The data acquired were used solely for this study. Also, the researcher ensured that all information provided was factual and well supported to maintain credibility. The researcher ensured that data were collected during respondents' available time and that the survey questionnaire and interview guide were unbiased and gender-neutral.

Statistical Treatment of the Data - A weighted mean was used to describe the extent of difficulties users encountered when using the Student Information and Accounting System (SIAS) and the level of SIAS in School Operations. To establish the relationship between the independent variable (IV) and the dependent variable (DV), and to test the significance of the relationship between the operational performance and the extent of difficulties encountered by the respondents. The data were analyzed using weighted means. To interpret the results, a four-point Likert scale interpretation guide was used, with mean scores interpreted as follows: 3.25-4.00 (Always Observed), 2.50-3.24 (Frequently Observed), 1.75-2.49 (Sometimes Observed), and 1.00-1.74 (Rarely Observed). The verbal descriptors were adapted from the scale provided by Joshi et al. (2015). Structural Equation Modeling (SEM) using the Partial Least Squares (PLS) method was employed. The analysis was conducted using WarpPLS version 7.0.

Ethical Considerations - The data acquired were used solely for this study. Also, the researcher ensured that all information provided was factual and well supported to maintain credibility. The researcher ensured that data were collected during respondents' available time and that the survey questionnaire and interview guide were unbiased and gender-neutral. Also, respondents could withdraw at any time if they felt uncomfortable answering the questionnaire. The proponent also ensured that the information provided in this study was genuine and accurate, and that it did not copy any information from other sources. For the literature review, the proponent acknowledged the authorities and provided proper citations in the references section of this study.

3. Results and Discussions

Figure 1 presents the initial thematic analysis on difficulties when using SIAS, which revealed three indicators: accessibility, connectivity, and speed. Accessibility is coded as usability, and information accuracy is coded as the participant says, "When using cellphones, the display is cut and cannot be zoomed out. Also, some of our grades are outdated." According to El Said's (2018) study, some factors limit users' interaction and navigation within a system, particularly when accessed on mobile devices. Connectivity was described as system integration. Several participants emphasized that certain essential features are not available in the SIAS. One participant highlighted, "There is no attendance sheet. The exams are not converted into MS Word." Another participant added, "It would be better if spreadsheets were integrated into the grading computation, since teachers still compute grades manually before inputting them, like the raw grades are to be computed manually and they could not directly be entered into

the system.” These responses indicate a lack of system integration; when the information system is partially utilized and not fully integrated, it can negatively affect the organization's overall operational efficiency (Sriadhi et al., 2022). Speed was interpreted as system performance. One participant stated, “It logs out quickly when the window/tab is not used”. Another participant added, “If the internet is slow and the system is refreshed, the modules and test questionnaires that were uploaded are not saved.” These statements indicate that system speed affects overall system quality and performance. Delays, automatic logouts, and failure to save uploaded materials reflect performance inefficiencies that disrupt user tasks. According to Kurnaedi (2024), speed refers to how quickly users receive the results of their inputs. Thus, system responsiveness is a crucial component of perceived performance and overall system quality.

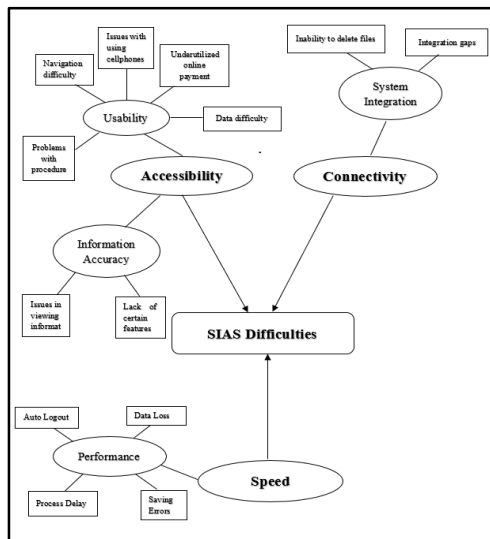


Figure 1. Initial Thematic Map of SIAS Difficulties

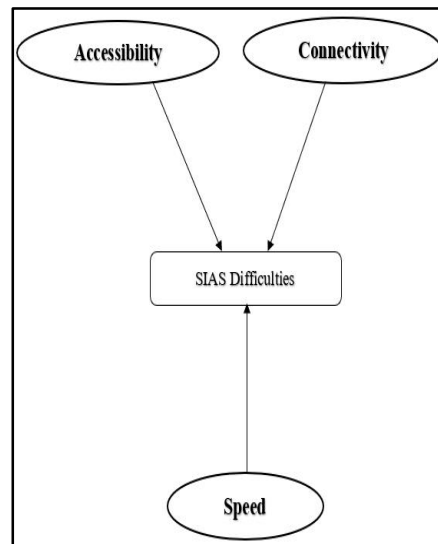


Figure 2. Final Thematic Map for SIAS Difficulties

After reviewing the subthemes, a final thematic map (Figure 2) was developed to highlight three major factors: accessibility, connectivity, and speed. These factors significantly contribute to the challenges users of the Student Information and Accounting System (SIAS) experience. According to the DeLone & McLean Model and the D&M model of 1992 (Sabeh et al., 2021), accessibility, connectivity, and speed directly impact user satisfaction. When these aspects function properly, they improve operational efficiency and enhance the overall quality of the information system. These three factors are closely linked to system quality, as a system is considered effective when it is easy to access, runs smoothly without interruptions, and responds to user requests. For the Student Information and Accounting System (SIAS) at the Divine Word College of San Jose, these three characteristics influence the experience of students, faculty, and administrative staff. The model, therefore, supports this study by showing that good system quality, through accessibility, connectivity, and speed, leads to higher user satisfaction and greater efficiency in school operations. Accessibility, connectivity, and speed are connected to the dimension of system quality. A system is considered effective when it is easy to access, works smoothly without interruptions, and responds quickly to user needs. In the case of the Student Information and Accounting System (SIAS) at the Divine Word College of San Jose, these qualities directly affect the experiences of students, faculty, and administrative staff with the system.

Table 2 presents the mean scores for the extent of difficulties encountered by 208 respondents when using the Student Information and Accounting System (SIAS) in terms of accessibility, connectivity, and speed. It should be noted that these statements were reverse-coded. Therefore, the results indicate a high level of ease of use for SIAS in terms of accessibility, connectivity, and speed, with an overall mean of 2.87. This shows that users generally encounter minimal difficulty when navigating and using the system across these key areas. Among the factors, accessibility obtained the highest composite mean of 2.92, compared to connectivity and speed, which both recorded a mean of 2.84. Since the results were interpreted using reverse coding, they now reflect a great level of accessibility. This indicates that SIAS is generally user-friendly and accessible across different devices. Effective

system accessibility also helps minimize organizational risks by supporting accurate data management (Putri & Wijaya, 2023). Connectivity also reflects a high level of ease, with a mean of 2.84. Interpreted through reverse-coding, the findings suggest that the different components of SIAS are generally well connected, allowing information entered in the system to update properly across related records and features. Users can access academic templates, view related data such as grades or statements of account, and move between system functions with minimal difficulty. These results indicate that the system's features are functioning in an integrated manner, which supports smoother transactions and better data coordination. This observation is consistent with Judijanto et al. (2023), who noted that well-integrated information systems improve workflow and enhance organizational performance. Similarly, system speed obtained a composite mean of 2.84 and was interpreted through reverse coding. This indicates that SIAS generally operates at an acceptable level of responsiveness. The results imply that the system can process user inputs and display information within a reasonable period, allowing users to complete their tasks without major delays. The highest mean was observed for the indicator of completing tasks in the system, suggesting that respondents are generally able to carry out their responsibilities using SIAS without significant interruption. Efficient system response is important because it supports productivity and helps users perform their duties more effectively. This observation aligns with the DeLone and McLean Information System Success Model, which identifies response time as a key element of system quality influencing user satisfaction and overall system benefits. It also aligns with Kurnaedi (2024), who described system speed as a system's ability to respond to user input and deliver results promptly. Similarly, Schmid (2023) emphasized that efficient system performance helps maintain workflow, whereas slow systems tend to interrupt tasks and reduce productivity. The findings are further supported by Ike (2022), who found that information systems improve institutional efficiency by automatically organizing and storing data for easier access. Because such systems commonly operate on cloud-based platforms, they enable smoother, more convenient use. In the case of SIAS, the capability contributes to a more efficient and accessible experience for its users. This finding is also consistent with the study of Sitorus et al. (2025), which emphasized that high information system quality is reflected in reliability, speed, and ease of access, while information quality includes the accuracy, relevance, and completeness of data. These characteristics are essential in creating a positive user experience. The result of the present study, therefore, indicates that when SIAS demonstrates these qualities, users are more likely to find it easier to perform their tasks.

Table 2
Mean Extent of Difficulties Encountered by the Respondents in Using SIAS in terms of Accessibility, Connectivity, and Speed

Accessibility	Weighted Mean	Interpretation
1. I cannot easily log in to the SIAS due to its non-user-friendly system.	2.82	High
2. The SIAS is not so user-friendly across different devices.	2.92	High
3. The SIAS is hard to access using a mobile device.	2.92	High
4. I have a problem retrieving records using SIAS.	2.96	High
5. Some system features are not available when I need them.	2.87	High
6. The SIAS is not accessible outside the school premises.	3.13	High
7. The SIAS increases redundant tasks.	2.95	High
8. The SIAS works hard without interruption.	2.77	High
Composite Mean	2.92	High
Connectivity		
1. I have difficulty connecting to different features in SIAS.	2.80	High
2. I experience unstable connections when uploading or syncing data in SIAS.	2.68	High
3. I have problems exporting files from SIAS.	2.85	High
4. I have difficulty accessing templates for academic records (such as grades, report cards, and permanent records) in SIAS.	2.91	High
5. The information I enter in SIAS does not update properly in other parts of the system.	2.96	High
6. SIAS does not work well with other programs or tools I use (ex. spreadsheets, word processors).	2.87	High
7. It is hard to link or view related data (like grades, records, or statements of account) in SIAS.	2.88	High
8. The SIAS has a few well-integrated features.	2.78	High
Composite Mean	2.84	High

Speed		
1. The SIAS does not process tasks within a reasonable time.	2.82	High
2. There are delays in loading information.	2.65	High
3. The SIAS becomes unresponsive when several users are logged in.	2.88	High
4. The SIAS performance affects the accuracy of outputs (e.g., grades, records).	2.88	High
5. The SIAS speed impacts the usage efficiency.	2.81	High
6. With the SIAS, I cannot easily complete tasks.	2.92	High
7. The SIAS operates slowly in response to user actions.	2.90	High
8. The overall speed of the system affects my productivity.	2.86	High
Composite Mean	2.84	High
Overall Mean	2.87	High

Scale: 3.25-4.00 Very High; 2.50-3.24 High; 1.75-2.49 Moderate; 1.00-1.74 Low

*Reverse Coded

The overall mean of 3.12 in Table 3 is interpreted as high, indicating that the Student Information and Accounting System (SIAS) is generally effective in supporting school operations at the Divine Word College of San Jose. Both efficiency and quality received a high level, with efficiency recording the highest weighted mean of 3.16. This indicates that SIAS enables users to complete tasks efficiently, streamlining academic and administrative processes and supporting the school's overall performance. The high level of efficiency can be attributed to the SIAS design, which supports task completion, timely performance, and easy navigation for all users. This is consistent with the findings of Reis et al (2017), who noted that accessible information systems make academic operations more organized and convenient for both educators and learners. This is also consistent with the study by Pauji et al. (2025), which emphasized that digital transformation has become a key agenda in higher education institutions. Universities are required to adopt information technology to address global challenges, including access to information and the need for more efficient educational services. At Divine Word College of San Jose, the use of SIAS supports this goal by improving school operations. Although the quality dimension had the lowest mean of 3.07 among the indicators, it is still considered high, indicating that the system continues to deliver reliable and satisfactory services. While there is room for minor improvements, SIAS's overall performance remains strong and meets its users' needs. This finding is consistent with the study of Anwarudin et al. (2023), which emphasized that academic information systems in universities should provide effective services to students. The study also noted that evaluating the level of service these systems deliver is necessary to improve their quality and ensure that information technology is used efficiently to support academic operations.

Table 3

Mean Level of SIAS in School Operations in terms of Quality and Efficiency

Quality	Weighted Mean	Interpretation
1. The SIAS produces reliable output.	3.17	High
2. The SIAS provides accurate information.	3.27	Very High
3. The Navigation of SIAS is straightforward and uncomplicated.	2.97	High
4. The SIAS interface is easy to understand.	3.18	High
5. The purpose of the menu is clearly stated.	3.18	High
6. SIAS functions operate as intended to meet my goals.	3.21	High
7. Pages load consistently without errors.	2.73	High
8. The SIAS program meets the users' objective.	3.00	High
9. SIAS performance remains stable during use.	2.96	High
10. The performance of SIAS goes beyond my expectations.	2.99	High
Composite Mean	3.07	High
Efficiency		
1. The SIAS supports efficient completion of my tasks.	3.28	Very High
2. The SIAS enables me to finish tasks in less time.	3.08	High
3. The SIAS improves the way I accomplish my work.	3.20	High
4. The SIAS helps me complete tasks on schedule.	3.23	High
5. The SIAS interface is designed to meet the needs of all users.	3.12	High
6. The system supports accurate and error-free transactions.	2.92	High
7. The SIAS features are appropriate for users.	3.23	High
8. The system content is clearly organized.	3.22	High
9. The menus and submenus clearly explain the usage.	3.10	High
10. Overall, the SIAS performance meets my expectations.	3.24	High
Composite Mean	3.16	High
Overall Mean	3.12	High

Scale: 3.25-4.00 Very High; 2.50-3.24 High; 1.75-2.49 Moderate; 1.00-1.74 Low

The structural model displayed in Figure 3 explores the relationship between the exogenous variable, difficulties encountered in using SIAS, characterized by three dimensions: accessibility (ACCESS), connectivity (CONNECT), and speed, and the endogenous variable, SIAS effectiveness, as described by quality and efficiency in using the SIAS. Path coefficients range from -.09 to -.34 with the corresponding p-values from <.01 to .10. The path coefficient (β) indicates the strength and direction of the relationship, while the p-value determines statistical significance. Because the items in the exogenous variable were reverse-coded, a negative Beta signifies that as difficulties increase, effectiveness decreases. As for explanatory power, the model explains 28% (R² = .28) of the variance in SIAS operational quality and 35% (R² = .35) of the variance in SIAS operational efficiency.

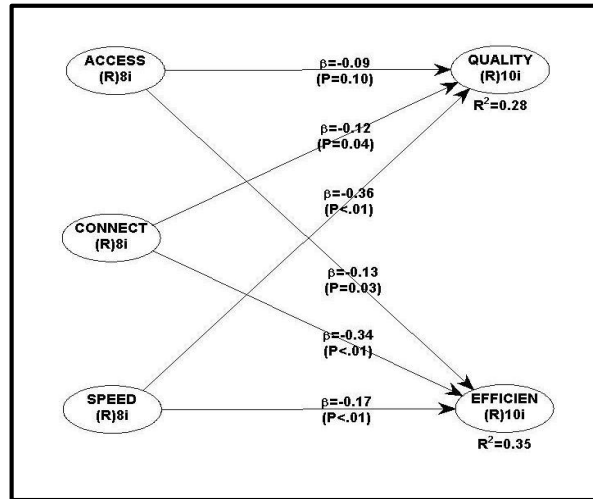


Figure 3. Structural Model of the Relationship Between Difficulties Encountered in Using SIAS and Effectiveness of SIAS in School Operations

Table 5

Path Coefficients and p-values for Ho

Path	Beta (β) Coefficient	p-value*	Interpretation
Ho: Difficulties Encountered→SIAS Effectiveness			
ACCESS→QUALITY	-0.087	.103	Not Significant
CONNECT→QUALITY	-0.122	.036	Significant
SPEED→QUALITY	-0.362	<.001	Highly Significant
ACCESS→EFFICIENCY	-0.129	.029	Significant
CONNECT→EFFICIENCY	-0.343	<.001	Highly Significant
SPEED→EFFICIENCY	-0.169	.006	Significant

**Significant at p<.05

The structural model analysis in Table 14, showing the path coefficients and p-values, evaluates the hypothesized relationships between the extent of difficulties encountered by SIAS users and the level of SIAS effectiveness in school operations. Regarding the impact on the level of SIAS in school operations, considering the quality of school operations, speed is the strongest contributor (β = -0.362, p < .001). This means that as processing speed difficulties increase, the perceived quality of the SIAS declines significantly. The path CONNECT→QUALITY is statistically significant (β = -0.122, p = .036), suggesting that connectivity is vital to operational quality. Poor connection moderately reduces the users' perception of SIAS quality. Meanwhile, accessibility was not directly associated with quality (β = -0.087, p = .103), indicating that it is not a predictor. Experiencing difficulty with login or navigation does not necessarily lead users to believe the SIAS is of low quality. While users find login or navigation issues annoying and impact efficiency, they do not link these issues to the core quality of the system's output.

However, according to El Said (2018), usability testing for mobile systems can be challenging due to the physical limitations of mobile devices, particularly their small screen sizes. These limitations may influence how users interact with and navigate a system. El Said (2018) also noted that mobility is an advantage of such systems, as users can access the portal on mobile phones at any time and from any location. Similarly, Rasmus et al. (2020)

emphasized that usability is a fundamental element of any interface system. When a system is difficult to navigate, users are less likely to continue using it. In contrast, systems that are simple to use and accessible through different devices, such as laptops and smartphones, tend to improve user satisfaction by reducing frustration and saving time. Usability testing, therefore, plays an important role in Human-Computer Interaction because it systematically evaluates how users interact with a system and how easily they can obtain the information they need (Tabrizi et al., 2017). Given that the institution relies heavily on this information system, accessibility remains important for completing academic and administrative tasks. However, the present study's findings indicate that accessibility does not significantly predict perceived SIAS quality. This indicates that although accessibility influences how users interact with the system, users do not necessarily associate accessibility issues with the overall quality of the system's output. Considering efficiency, connectivity is viewed as the primary barrier ($\beta = -0.343$, $p < .001$). The path from connectivity to efficiency is highly significant, indicating that connectivity issues hinder efficient task completion in SIAS. This is supported by Kuziemyky et al. (2017), who defined connectivity as the integration of tasks, people, and technology, which is essential for achieving intended outcomes. Judijanto et al. (2023) highlighted that successful system integration streamlines processes and improves overall performance. Network quality also plays a role, as poor connectivity can delay essential processes, including attendance monitoring, affecting academic and administrative operations (Ramos et al., 2024; Brugliera, 2024). Amponsah et al. (2022) and Azcarraga & Peña (2019) further emphasized that multiple sources of internet access do not guarantee reliable connectivity, a problem that remains in the Philippines.

When it comes to speed, it has a significant negative impact on efficiency ($\beta = -0.169$, $p = .006$), suggesting that even if users find SIAS high quality, these connectivity difficulties tend to slow the workflow physically. This aligns with Kurnaedi (2024), who defined system speed as the system's response to user input, and Mogaka et al. (2023), who showed that delayed responses frustrate users and reduce task efficiency. Schmid (2023) also confirmed that faster processing is crucial for operational efficiency, decision-making, and user satisfaction. Secreto et al. (2025) and Edwards (2022) further demonstrated that digital systems speed up transactions and improve tracking of academic performance compared to manual processes. Based on the results, the null hypothesis, which posits no significant relationship between the difficulties encountered and SIAS in school operations, is generally rejected, except for the path ACCESS \square QUALITY. This confirms that, to prove the SIAS in school operations, the school must prioritize resolving speed and connectivity issues to enhance perceived quality, thus boosting operational efficiency. Connectivity and Speed are critical for the overall effectiveness of information systems in academic and administrative operations (Kuziemyky et al., 2017; Sriadhi et al., 2022; Kurnaedi, 2024; Judijanto et al., 2023). Addressing these factors improves workflow efficiency, perceived system quality, and institutional performance.

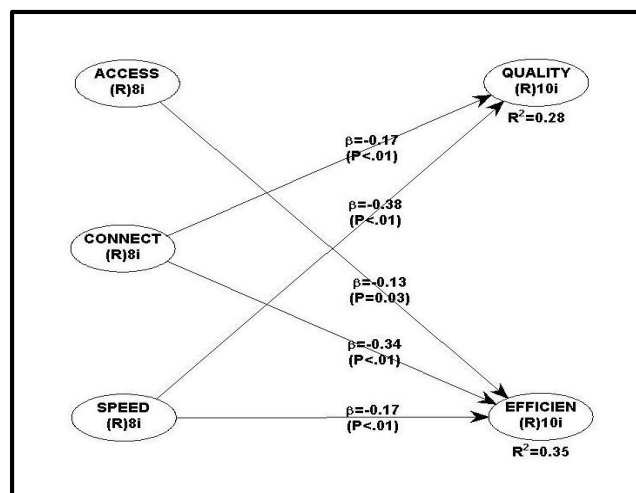


Figure 4. The Emerging Model of the Relationship Between Difficulties Encountered in Using SIAS and the Effectiveness of SIAS in School Operations

The emerging model in Figure 4 illustrates the refined causal relationships after the non-significant path, such as the link between accessibility and quality, was removed. The model focuses on how accessibility (ACCESS), connectivity (CONNECT), and speed (SPEED) serve as predictors for SIAS quality and efficiency. The emerging model highlights the most significant relationships between the variables. The model is more effective at predicting efficiency ($R^2=0.35$) than quality ($R^2=0.28$), suggesting that technical difficulties hinder work speed more than perceptions of SIAS value. Significance levels were less than .001 for four paths and .003 for the fifth path (ACCESS→EFFICIENCY).

Table 6
Standardized Estimates of the Path in the Emerging Model

Hypothesis	Standardized Estimates (β)	Standard Error	p-value*	Effect Coefficient**	Effect Size
Ho: Difficulties Encountered→SIAS Effectiveness					
CONNECT→QUALITY	-0.174	0.067	.005	0.081	Small
SPEED→QUALITY	-0.379	0.065	<.001	0.195	Medium
ACCESS→EFFICIENCY	-0.129	0.068	.029	0.065	Small
CONNECT→ EFFICIENCY	-0.343	0.065	<.001	0.197	Medium
SPEED→ EFFICIENCY	-0.169	0.067	.006	0.089	Small

*Significant at $p < 0.05$

** Effect size coefficient: 0.02 – small, 0.15 – medium, 0.30 – large

The analysis of the emerging model and the corresponding hypothesis test results provide a picture of how technical difficulties impact the effectiveness of the Student Information Accounting System (SIAS) in school operations. Table 14 discloses the standardized estimates of the five paths in the new model. Considering the impact on system quality, the model reveals speed as the strongest negative predictor ($\beta = -0.379$, $p < .001$), followed by connectivity ($\beta = -0.174$, $p = .005$). Users typically judge the quality of the SIAS by its processing speed. As the highest among quality predictors, this path has a medium effect size of .195. This indicates that processing speed substantially affects users' perception of the SIAS system's quality. As Kurnaedi (2024) defines, system speed is the rate at which a system or application responds to user input and delivers results.

System speed affects usage efficiency, such as how quickly users complete their tasks. The findings of the present study are also supported by Schmid (2023), who noted that a slow or lagging system can disrupt workflow and hinder user productivity. Supporting this view, Li & Zhu (2022) explained that timeliness refers to the system's ability to respond promptly to user requests. When a system responds quickly and delivers results promptly, users can complete their tasks more efficiently, strengthening their perception of system quality. Similarly, Ningsih and Kurniawan (2023) explained that system quality refers to the quality of the outputs generated by an information system.

In many cases, users judge a system's quality by how well it performs and the reliability of its results. These user perceptions are important because they influence user satisfaction and the benefits users derive from the system. In the present study, the findings indicate that system speed is an important factor in determining system quality. When the system responds quickly and processes tasks efficiently, users tend to perceive the system as more reliable and effective. This indicates that system speed significantly influences how users evaluate the quality of the SIAS and, in turn, their level of satisfaction. As for operational efficiency, connectivity ($\beta = -0.343$, $p < .001$) is the primary barrier to achieving school operations and the most vital factor for operations. It has a medium effect (.197) on operational efficiency, making it a primary contributor to productivity. Access (.065) and speed (.089) registered a small effect on efficiency. While the relationships between access and efficiency ($\beta = -0.129$, $p = .029$) and between speed and efficiency ($\beta = -0.169$, $p = .006$) are statistically significant, their individual contributions to the model are lower than those of the medium-effect factors. These findings are supported by previous studies that emphasize the critical role of connectivity in information systems. Kuziemy et al. (2017) explained that connectivity brings together essential components such as people, tasks, and technology into a system that works smoothly and that any lack of integration can limit overall efficiency. The quality and reliability of network access are also important for smooth system operation, as noted by Ramos et al. (2024) and Brugliera (2024). In the same view, Amponsah et al. (2022) and Azcarraga & Peña (2019) highlighted that unreliable internet connectivity can

interrupt tasks and lower efficiency.

Altogether, these studies show that both proper system integration and reliable network access are essential for operational efficiency, which aligns with the results of the present study. The standard error value represents the precision of the estimated path coefficients. Across all significant paths in the emerging model, these values remain very low and stable, ranging from 0.065 to 0.068. The study finds the null hypothesis rejected. In fact, the hypothesis test confirms that five out of the six original relationships are statistically significant predictors of SIAS in school operations. It can be concluded that while SIAS is fundamentally accessible, its performance in school operations depends on technical stability. This confirms that speed is the standard of quality by which SIAS is assessed, while connectivity serves as the efficiency tool for the school operation. The present study highlights connectivity and speed as key factors influencing the efficiency of SIAS. This aligns with Judijanto et al. (2023), who found that well-integrated systems streamline processes and improve overall performance. Similarly, Mogaka et al. (2023) emphasized that delays in system response can frustrate users and reduce task efficiency. Similarly, Secreto et al. (2025) and Edwards (2022) showed that digital systems accelerate transactions and make it easier to track academic performance than manual processes. These studies underscore the practical importance of addressing connectivity and speed issues, supporting the present finding that improving these factors can enhance both user experience and school operations. These findings suggest that management should focus on enhancing system speed and connectivity, as doing so will have the most significant impact on SIAS performance in school operations and ensure the system is used to its full potential. Addressing related challenges, such as poor data quality and system failures (Ameen et al., 2024), is also essential to ensure that the information system functions effectively. By prioritizing system quality, organizations can improve performance, increase user satisfaction, and ultimately achieve their strategic goals (Abdullah et al., 2024).

Table 7

Proposed Improvement Plan to Enhance Student Information and Accounting System (SIAS)

Program Component	Objectives	Strategies/ Activities	Personnel Responsible	Time Frames	Budget
SIAS IT support and monitoring program	To ensure there is a staff member responsible for managing and supporting SIAS operations and to implement its full features to support efficient use by users.	Assign IT personnel specifically for SIAS to handle technical issues; monitor system performance; coordinate with the SIAS specialist or developer when problems occur; and provide assistance to students, faculty, and staff (especially from the Registrar and Finance offices) during high-traffic periods such as enrollment.	School IT personnel, SIAS IT Specialist/ System Developer	throughout the school year	
Improving System Processing Speed	To reduce delays in information loading and improve the quality of SIAS operations	Focus technical investments on upgrading server capacity and optimizing system configuration to reduce processing inactivity and improve response time.	SIAS IT Specialist/System Developer/School Administrators	every five years	₱ 200, 000.00
Back-End System Stability Improvement	To ensure SIAS operates reliably during high-traffic operations.	Collaborate with SIAS developers or IT specialists to strengthen internal server operations, allowing the system to process multiple requests without lagging or timing out.	SIAS IT Specialist/System Developer, School Administrators	every five years	₱ 200, 000.00

Student Information and Accounting System: In the school operations of the Divine Word College of San Jose

Strengthening Network Connectivity	To improve operational efficiency by maintaining stable bandwidth and reliable local network access.	Prioritize bandwidth stability and improve local network reliability. Coordinate with the SIAS IT specialist or developers to ensure the system works properly with the school's network setup.	School Administrator, School IT Personnel, SIAS IT Specialist/System Developer	every five years	₱ 100,000.00
Regular Internet Monitoring	To prevent disruptions caused by unstable internet during school operations.	Assign IT personnel to monitor internet connectivity regularly and immediately address any network issues that could affect system access.	School IT Personnel	every week	
Student Orientation and Support	To help students use SIAS correctly and efficiently.	Conduct orientation sessions, provide user guides or video tutorials, and assign IT personnel to assist students during busy periods like enrollment or grade release.	School IT Personnel, Registrar's Office	every beginning of the school year	

The improvement plan in Table 6 directly addresses the main technical challenges identified in the study. Assigning IT personnel to manage SIAS ensures that technical issues are addressed quickly, system performance is closely monitored, and the system's full features are fully utilized. This is supported by Kuziemsy et al. (2017), who emphasized that integrating people, tasks, and technology is essential for the smooth operation of systems. Improving system processing speed through server upgrades and optimizing system configurations addresses delays that affect the user experience. As Kurnaedi (2024) explained, system speed directly influences how quickly users can complete tasks, and Schmid (2023) noted that slow systems interrupt workflow and reduce productivity. Strengthening back-end stability ensures that the system can handle multiple requests during peak periods without lagging or timing out, which Mogaka et al. (2023) found is critical for maintaining efficiency and user satisfaction. Connectivity challenges are addressed by improving network reliability, monitoring internet stability, and providing technical support to administrative staff in the Registrar and Finance offices as well as faculty and students. Ramos et al. (2024) and Brugliera (2024) emphasized that network quality and reliability are key to smooth system operation, while Amponsah et al. (2022) and Azcarraga & Peña (2019) showed that unreliable connectivity disrupts tasks and lowers efficiency. Orientation sessions, user guides, and direct IT support for students also help them use the system more effectively, especially when some features are not yet fully implemented. Finally, addressing problems such as poor data quality and system failures (Ameen et al., 2024) further improves overall system reliability. By prioritizing system quality, these interventions enhance performance, increase user satisfaction, and support the institution in achieving its operational and strategic goals (Abdullah et al., 2024). In summary, this improvement plan applies the study's findings by focusing on speed, connectivity, and technical stability, ensuring that SIAS is reliable, efficient, and fully functional for both academic and administrative operations.

4. Conclusions

Based on the summary of the findings, the study concludes that the difficulties encountered by users of the Student Information and Accounting System (SIAS) boil down to three: accessibility, connectivity, and speed. Respondents generally experienced minimal difficulty in accessing the system. The results indicate minimal difficulty with system connectivity when using SIAS, and it operates at an acceptable speed for the Student Information and Accounting System (SIAS) in School Operations. While occasional interruptions may occur during page loading, the errors are minimal and do not affect the system's overall operation. The high level of efficiency can be attributed to the IAS design, which supports task completion, timely performance, and easy

navigation for all users. Speed has the highest negative impact on SIAS quality and efficiency and is highly significant. As speed increases, perceived quality decreases, while connectivity is viewed as the primary barrier and is highly significant. As connection issues increase, they hinder efficient task completion. An improvement plan should be adopted to enhance the Student Information and Accounting System (SIAS).

Recommendations - Based on the findings and conclusions presented, recommendations are provided to enhance the Student Information and Accounting System (SIAS) and address the identified difficulties. The study revealed the difficulties encountered by users of the Student Information and Accounting System (SIAS), namely accessibility, connectivity, and speed; thus, these should be addressed. The developer may ensure that system features are improved to provide ease of access for all users. Considering connectivity as a major barrier to operational efficiency, administration may prioritize bandwidth stability and local network reliability to maximize the system's utility. Since speed is the strongest predictor of operational quality, administrators may consider investing in server upgrades to reduce processing inactivity. Administrators may introduce monitoring tools to track system performance and detect issues in real time, ensuring consistent and reliable system output. To maintain SIAS's efficiency in school operations, administrators may invest in a monitoring tool to ensure smooth system processes and enable immediate troubleshooting of technical issues. Administrators may focus on technical improvements, such as optimizing system performance, to maintain system quality. With coordination among SIAS developers, administrators may focus on strengthening back-end stability to ensure reliable system operation, especially during periods of high traffic. Coordination with the SIAS developer may be strengthened to implement updates, while system integration may be improved to ensure seamless connectivity among all system components.

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Swine Industry: Challenges and strategies during African Swine Fever (ASF) outbreak in Occidental Mindoro

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Abstract

In the Philippines, African Swine Fever has posed one of the most serious threats to the swine industry in decades. Thus, this aimed to examine the challenges and strategies of swine entrepreneurs during the African Swine Fever (ASF) outbreak in Occidental Mindoro. A sequential exploratory design was employed to describe the challenges and coping strategies of the 310 swine entrepreneurs in the province. The themes derived from the interviews served as the basis for the quantitative phase. The findings revealed that swine entrepreneurs faced challenges related to financial constraints, market disruption, and market volatility. Meanwhile, strategies such as collaboration, biosecurity, and strategic marketing were widely practiced to cope with the crisis. Statistical analysis indicated a significant relationship between the challenges encountered and the strategies employed. Moreover, the results indicated that swine entrepreneurs encountered considerable market disruptions, particularly due to restrictions on the movement of pigs and pork products, which limited their ability to sell and distribute their swine. Thus, swine entrepreneurs were greatly affected by market volatility, as fluctuations in pork prices and unstable market demand created uncertainty and financial risks during the ASF outbreak. The results highlighted the importance of strengthening support programs, improving biosecurity awareness, and enhancing collaboration among stakeholders to build resilience in the swine industry during disease outbreaks. This study recommends that the Department of Trade and Industry and the Department of Agriculture provide capacity-building activities on strategic marketing, product diversification, and the development of value-added pork products to help swine entrepreneurs sustain their income despite market disruptions.

Keywords: African Swine Fever, swine entrepreneurs, financial constraints, market disruptions, strategic marketing

Swine Industry: Challenges and strategies during African Swine Fever (ASF) outbreak in Occidental Mindoro

1. Introduction

The swine industry plays a vital role in ensuring global food security, providing income for millions of rural households, and supporting national economies. Within the swine sector, the industry is particularly significant due to the high demand for pork, which remains one of the most widely consumed meats worldwide. However, the global pork industry has faced tremendous challenges due to African Swine Fever (ASF)—a highly contagious viral disease that affects both domestic and wild pigs. Since its resurgence in 2018, ASF has rapidly spread across countries in Asia, Europe, and Africa, leading to massive production losses, trade disruptions, and economic instability. As Brown et al. (2024) emphasize, ASF not only threatens food supply but also imposes severe restrictions on trade and movement, thereby disrupting global pork markets and livelihoods.

In the Philippines, ASF has posed one of the most serious threats to the swine industry in decades. The disease has caused significant economic losses, particularly among small and medium-scale farmers who rely on pig farming as their main source of income. Data from the Philippine Statistics Authority (2021) show a drastic decline in swine production and total swine inventory between 2019 and 2021, accompanied by fluctuating pork prices and supply shortages. To control the spread of ASF, the government implemented strict measures, including quarantine protocols, movement restrictions, and depopulation of infected herds. While these interventions were necessary for disease containment, they also triggered market disruptions that limited access to markets and inputs, constrained farmer mobility, and reduced the profitability of swine operations.

The effects of ASF have been strongly felt in Mindoro Island, part of the MIMAROPA region. On January 22, 2024, the Department of Agriculture's Bureau of Animal Industry (BAI) confirmed new ASF cases in three towns of Occidental Mindoro—San Jose, Sta. Cruz and Rizal—prompting immediate culling, surveillance, and strict movement control (Department of Agriculture 2024). Similar incidents were recorded in Oriental Mindoro, particularly in Naujan, Calapan, and Baco, where outbreaks had previously occurred. Under DA regulations, any municipality with a confirmed case is placed under a “red zone,” prohibiting the transport of hogs within or out of the area to contain the virus. These restrictions, though essential for biosecurity, have placed significant strain on local entrepreneurs who depend on continuous trading and access to supply chains for their livelihoods. Many small-scale farmers have faced financial hardships due to depopulation, reduced demand, and limited recovery assistance. Despite global and national studies highlighting the epidemiological and economic effects of ASF, a research gap persists in understanding how swine farmers at the community level—especially in affected areas such as Occidental and Oriental Mindoro—adapt and survive amid these disruptions. Previous research has focused heavily on the disease's biological control and national trade implications, often overlooking the human dimension: the experiences, coping strategies, and resilience of local farmers navigating uncertainty and loss. Thus, this study aimed to explore the lived experiences, adaptive responses, and survival strategies of swine entrepreneurs in Mindoro. By highlighting their challenges and innovations during the ASF outbreak, the research sought to contribute to the development of sustainable recovery strategies and policies that strengthen resilience in the Philippine swine sector.

Statement of the Problem - This study aimed to explore the challenges encountered and the strategies employed by swine entrepreneurs during the African Swine Fever Outbreak. Specifically, it aimed to answer the following questions: (1) What are the challenges encountered by the swine entrepreneurs during the African Swine Fever Outbreak in Occidental Mindoro? (2) What strategies did swine entrepreneurs practice during the African Swine Fever Outbreak? (3) What is the profile of swine entrepreneurs in terms of number of pigs, location, and capitalization? (4) What is the extent of the challenges encountered by the swine entrepreneurs in terms of financial constraint, market disruption, and market volatility? (5) What is the extent of the strategies employed by the swine

entrepreneurs during the African Swine Fever outbreak in terms of Collaboration, Biosecurity, and Strategic Marketing? (6) Is there a significant relationship between the challenges encountered and the strategies employed by the swine entrepreneurs? (7) Is there a significant relationship between the profile of swine entrepreneurs and the strategies employed by the swine entrepreneurs? (8) What program may be proposed to develop new strategies to lessen the impact of the African Swine Fever Outbreak??

Significance of the Study - This study is significant because it sought to provide a deeper understanding of how swine entrepreneurs in Occidental Mindoro survived and adapted during the African Swine Fever (ASF) outbreak. By examining the challenges they faced and the strategies they implemented, this research offers valuable insights to strengthen the swine industry's resilience against future disease outbreaks. The findings of this study are expected to benefit the following groups: swine entrepreneurs. The results will help them identify effective coping strategies and biosecurity practices to reduce production losses, protect their herds, and improve business continuity during disease outbreaks. For Local Government Units (LGUs) and Policymakers, the study provides evidence-based recommendations to guide the development of localized policies, financial support programs, and disease management interventions to minimize the socio-economic impact of ASF. For veterinary and Biosecurity Agencies: Insights from this research can help in designing training programs, awareness campaigns, and technical assistance tailored to the needs of small- and medium-scale entrepreneurs in the province. For Researchers and Academics: This study addresses a research gap by examining localized, community-level responses among swine entrepreneurs during ASF outbreaks. It can serve as a reference for future research on resilience in the swine industry, disaster preparedness, and the protection of rural livelihoods. For Consumers and the General Public: A more resilient swine industry ensures a stable pork supply and contributes to food security, benefiting the wider community.

Scope and Delimitation of the Study - This study focused on identifying the challenges encountered and the survival strategies employed by swine entrepreneurs affected by the African Swine Fever (ASF) outbreak in Occidental Mindoro. The respondents in this study were swine entrepreneurs who experienced ASF-related losses, such as pig mortality, production stoppages, or market disruptions, during the outbreak. The study is limited to swine entrepreneurs whose primary source of livelihood is swine raising. Other swine entrepreneurs involved in cattle, goat, or poultry production were excluded from the study because ASF affects only swine. Furthermore, the study included only respondents engaged in swine production at the time of the ASF outbreak and who directly experienced its effects. The study did not cover epidemiological data on ASF strains, laboratory analyses, or veterinary interventions beyond what respondents reported. The findings are based on survey responses and interviews, which may be affected by recall bias or respondents' willingness to disclose financial and operational information. Despite these delimitations, the researcher made efforts to cover a representative sample of affected swine entrepreneurs in Occidental Mindoro to ensure that the results provide a realistic understanding of the challenges, strategies, and potential programs that can help improve the resilience of the swine industry during similar outbreaks.

2. Methodology

Research Design - This study employed an exploratory sequential design, which combines qualitative and quantitative approaches to better understand how swine entrepreneurs in Occidental Mindoro survived the African Swine Fever (ASF) outbreak. This design follows a two-phase process, starting with qualitative data collection and analysis, followed by a quantitative phase that is based on the initial findings (Creswell & Plano Clark, 2018). In the first phase, a qualitative approach was used to explore the lived experiences of swine entrepreneurs, particularly the challenges they faced and the survival strategies they adopted during the ASF outbreak. The insights gathered from this phase served as the foundation for developing the quantitative research instrument. In the second phase, a quantitative descriptive-correlational design was conducted to determine the level of challenges encountered, the extent of survival strategies implemented, and the relationship between these variables. By integrating both methods, the study achieved a more comprehensive understanding of the phenomenon, combining rich experiential insights with measurable evidence.

Respondents of the Study - For the qualitative phase, the respondents of the study were twenty (20) swine entrepreneurs who were affected by the African Swine Fever (ASF) outbreak in Occidental Mindoro. A purposive sampling technique was used in the qualitative phase to ensure that participants had rich, meaningful experiences related to the outbreak. This phase included active swine entrepreneurs, cooperative leaders, and local agricultural officers who were knowledgeable about the industry's condition before, during, and after the ASF crisis. Moreover, the researcher personally approached the identified swine entrepreneurs in their respective barangays and requested their voluntary participation in a short interview regarding their experiences, challenges, and coping strategies during the ASF outbreak. The respondents selected for the qualitative phase were excluded from the questionnaire administration during the quantitative phase to avoid duplicate responses.

For the quantitative phase of the study, the respondents were selected from the total population of two thousand nine hundred thirty-nine (2,939) swine entrepreneurs affected by African Swine fever in Occidental Mindoro. The list of affected swine entrepreneurs was obtained from the Provincial Veterinary Office. The sample size was determined using the Raosoft Sample Size Calculator with a 5% margin of error and a 95% confidence level. Based on the computation, the required sample size for the study was Three Hundred Forty (340) respondents. These respondents were selected through a stratified random sampling technique to ensure fair representation of swine entrepreneurs affected by ASF in the province. During the distribution of the survey questionnaires, only three hundred ten (310) out of the three hundred forty (340) targeted respondents agreed to participate in the study. These swine entrepreneurs willingly answered the survey, and their responses provided the primary quantitative data for analyzing the impact of the African Swine Fever outbreak on swine entrepreneurs in Occidental Mindoro.

Research Instrument - In the qualitative phase, the researcher utilized a semi-structured interview guide as the main data-gathering instrument. This tool was designed to explore in-depth the experiences, coping mechanisms, and survival strategies of swine entrepreneurs affected by the African Swine Fever (ASF) outbreak in Occidental Mindoro. The interview questions were formulated based on the study's conceptual framework and were reviewed by a research adviser. Responses from participants were recorded, transcribed, and analyzed using thematic analysis, which allowed the researcher to identify recurring patterns, themes, and insights relevant to the challenges and strategies of swine entrepreneurs. For the quantitative phase, a researcher-developed questionnaire served as the study's main instrument. It was patterned after the conceptual framework and its relation to the research problem. The questionnaire items were based on the respondents' qualitative responses. The first part of the questionnaire consisted of a profile of swine entrepreneurs in terms of the number of pigs, location, and capitalization. The second part assessed the extent of challenges encountered by swine entrepreneurs in terms of financial constraint, market disruption, and market volatility, as well as the degree to which survival strategies such as collaboration, biosecurity, and strategic marketing were practiced. Participants were given two days to complete the questionnaire and return it to the researcher. Respondents were asked to rate each statement based on the set Likert scale, as it determined the level of job satisfaction of the respondents toward their employment outcomes: 5 - True of me to a very great extent; 4 - True of me to a great extent ; 3 - True of me to a moderate extent; 2 - Slightly true of me; 1 - Not true of me.

In addition, questionnaires at each initial stage were presented to a group of specialists for validation before the survey was distributed for reliability testing. The researcher must tap the expertise of the three (3) professors from the graduate school program of Divine Word College of San Jose and two (2) from Occidental Mindoro State College. Upon validation, the researcher began formulating the final copy of the questionnaire, incorporating all suggestions. A group of 30 respondents was asked to answer the 34-item researcher-made questionnaire, which was administered once. Reliability analysis using Cronbach's Alpha measures the internal consistency of a scale, essentially how closely related a set of items is as a group. A Cronbach's Alpha value of 0.70 or higher is generally considered the threshold for acceptable or good reliability, indicating that the survey instruments used are consistently measuring their intended constructs. The analysis was performed on a sample size of 30 cases, with a 100% validity rate and no cases excluded. The internal consistencies, based on standardized items for all six constructs, exceeded the 0.70 benchmark, and the results are presented in Table 1.

Table 1
Result of Reliability Analysis

Items	Number of Items	Reliability Coefficients*	Analysis
I. Challenges Encountered			
A. Financial Constraint	6	0.769	High Reliability
B. Market Disruption	6	0.718	High Reliability
C. Market Volatility	5	0.766	High Reliability
II. Survival Strategies Employed			
A. Collaboration	5	0.947	Very High Reliability
B. Biosecurity	6	0.872	High Reliability
C. Strategic Marketing	6	0.782	High Reliability

*Based on standardized items

The construct of strategic marketing had the highest reliability in this dataset, with an alpha of .818. This is closely followed by collaboration at .813. These scores suggest that the items used to measure these variables are highly cohesive and provide very stable results. Market volatility (0.766) and Financial Constraint (0.769) both demonstrate high reliability. Biosecurity (0.706) and market disruption (0.718) yielded the lowest alpha scores in the group, though they remain well above the 0.70 cut-off. While these scales are reliable, they exhibit slightly more variance between items than the collaboration or strategic marketing scales. The results indicate that all six scales used in this study possess high internal consistency. The data suggest that the measurement scales are dependable and that the items within each scale consistently measure the same underlying concepts. Since every construct surpassed the required threshold, the instrument can be used for further statistical analyses.

Data Gathering Procedure - Before conducting the study, the researcher sought permission from the Office of the Municipal Agriculturist and other concerned local government agencies in Occidental Mindoro to distribute questionnaires and conduct interviews among swine entrepreneurs. Upon approval, the researcher personally visited the nine selected municipalities to coordinate with agricultural officers and local officials to help identify qualified respondents. The purpose of the study was explained clearly to all participants, and their informed consent was obtained before data collection. For the qualitative phase, the researcher conducted interviews and focus group discussions with selected swine entrepreneurs, cooperative leaders, and agricultural officers. These sessions were guided by open-ended questions that aimed to gather insights into their experiences, coping mechanisms, and survival strategies during the African Swine Fever (ASF) outbreak. Notes were taken, and, when permitted, conversations were audio-recorded to ensure accuracy and completeness of the data. For the quantitative phase, a total of five (5) days was allotted; validated and reliable questionnaires were personally distributed to the respondents. The researcher, with the assistance of designated local officials, ensured that all respondents answered the questionnaires completely and honestly. The data collection focused on the extent of the challenges they encountered—such as financial constraints, market disruption, and market volatility—and the strategies employed, including biosecurity, collaboration, and strategic marketing. After all the data had been gathered, the researcher checked the questionnaires for completeness and accuracy before proceeding to the data analysis stage. Confidentiality and ethical considerations were strictly observed throughout the process to ensure that participants' responses were treated with respect and used solely for academic purposes.

Statistical Treatment of the Data - For the qualitative phase, thematic analysis was employed to interpret responses gathered from interviews and open-ended questions. This method was chosen because it enabled the identification, analysis, and interpretation of recurring themes and patterns within the participants' narratives. The researcher systematically coded and categorized the qualitative data, enabling the emergence of meaningful themes related to the challenges faced by swine entrepreneurs and the coping mechanisms they adopted during the African Swine Fever (ASF) outbreak. Through this process, the researcher uncovered underlying insights, perceptions, and lived experiences that numerical data could not fully capture. Thematic analysis complemented the quantitative results by providing contextual depth and a richer understanding of how swine entrepreneurs responded to the crisis.

For the quantitative phase, the data gathered from the survey were carefully organized, coded, and tabulated

for analysis. To address the study's objectives, descriptive statistics were used. Specifically, the weighted mean was employed to describe the extent of the challenges encountered by swine entrepreneurs (in terms of financial constraint, market disruption, and market volatility) and the degree to which survival strategies (such as collaboration, biosecurity, and strategic marketing) were practiced during the ASF outbreak in Occidental Mindoro. To test the study's hypotheses, Warp PLS V7 was used to examine the significant relationship between the challenges faced by swine entrepreneurs and the strategies they employed during the ASF outbreak. Warp PLS is an appropriate statistical tool for testing complex relationships between variables, and it helped assess the strength and direction of the relationships between the challenges (financial constraints, market disruptions, and market volatility) and the strategies (collaboration, biosecurity, and strategic marketing). A significance level of 0.05 was used to decide whether to accept or reject the null hypothesis, which posits that there is no significant relationship between the challenges experienced and the survival strategies adopted by the respondents. All statistical computations were performed using WarpPLS V7 and other relevant software to ensure accuracy and reliability of the results. The findings from the quantitative analysis, enriched by insights drawn from the thematic analysis of the qualitative data, provide a deeper understanding of the coping mechanisms and lived experiences of the swine entrepreneurs.

Ethical Considerations - Ethical considerations are the cornerstone of this study, guiding every aspect of the research journey. From the treatment of human subjects to data handling and intellectual property rights, ethical integrity remains paramount. This study is committed to upholding the highest ethical standards to ensure the credibility and validity of its findings. The researcher guaranteed that the data were untraceable to anybody other than the researcher. Additionally, respondents were informed that the findings would be presented in a research paper and may be published in a peer-reviewed journal, but their identities would remain anonymous. The researcher certified that the research did not harm respondents and that the information was used appropriately. The researcher guaranteed that the respondent's participation in the study was entirely voluntary and that they may withdraw at any moment. No further data collection or analysis occurred beyond this point, and all existing data were collected. On the first page of the survey form, a consent letter described the study's major components and what was expected of them as respondents. They had consented to this, indicating their complete understanding of their involvement in this research project.

3. Results and Discussions

The participants' initial responses were recorded, transcribed, tabulated, and coded to extract significant themes, which are presented in the initial thematic map. The map serves as the starting point of the qualitative analysis and guides the development of deeper interpretations and discussions. Based on the coding process, several themes emerged that describe the challenges encountered by swine entrepreneurs during the African Swine Fever (ASF) outbreak in Occidental Mindoro, including economic struggles, policy restrictions, market fear, and adaptive strategies.

The theme of economic struggle reflects the financial difficulties swine entrepreneurs faced during the outbreak. Many participants described how the ASF outbreak led to increased expenses and decreased income, resulting in financial losses. One participant shared, "To be honest, our expenses increased, and our income decreased, and there were restrictions due to the shortage of swine supply caused by the large number of pigs being slaughtered every day." The final thematic map presents the refined themes that emerged after a deeper analysis of the coded responses of the swine entrepreneurs. The themes were consolidated into a major thematic category: challenges encountered during the African Swine Fever (ASF) outbreak. This theme reflects the various difficulties swine entrepreneurs in Occidental Mindoro have experienced as a result of the ASF crisis. Under the theme challenges encountered, three major subthemes were identified: financial constraint, market disruption, and market volatility. Financial constraints reflect the economic hardships experienced by the respondents, including reduced income, mounting debt, rising operational expenses, and financial losses. The findings indicate that many swine entrepreneurs struggled to sustain their businesses as the ASF outbreak reduced their primary source of livelihood. This supports the study by Chenais Eva et al. (2019), which stated that ASF outbreaks significantly affect the

economic stability of smallholder pig farmers due to production losses and limited market opportunities.

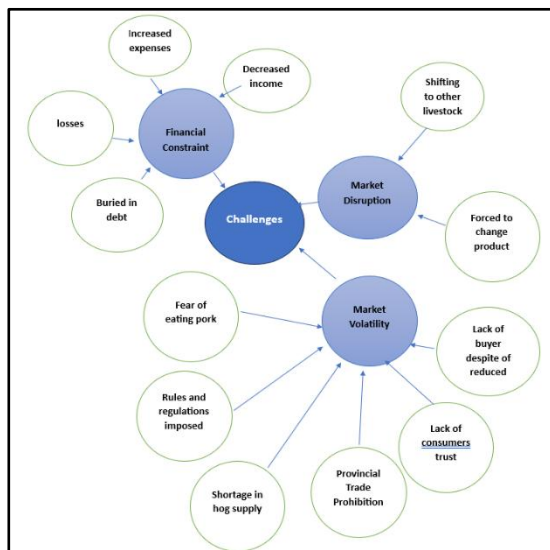


Figure 1. Initial Thematic Map of Challenges Encountered by the Swine Entrepreneurs

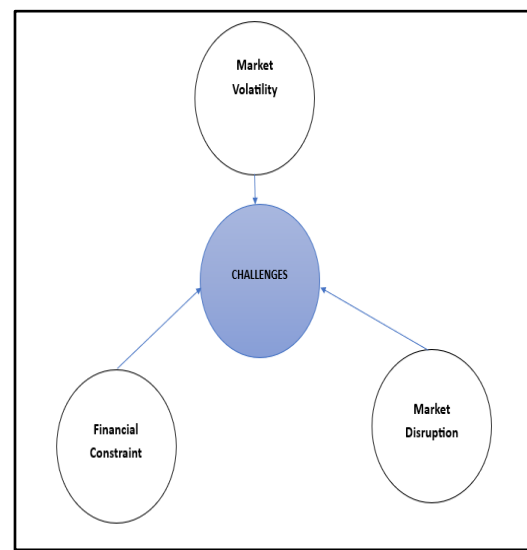


Figure 2. Final Thematic Map of Challenges Encountered by the Swine Entrepreneurs

Market disruption highlights the effects of government regulations, trade restrictions, and limitations on pig movement, which have significantly disrupted the swine industry's supply chain. The implementation of quarantine measures and restrictions on the transport of pigs contributed to reduced trading activities and limited access to markets for swine entrepreneurs. According to Fernandez-Colorado et al. (2024), strict disease control policies, such as movement restrictions and quarantine measures, are necessary to prevent the spread of ASF. Still, they also disrupt the swine trade and negatively affect farmers' livelihoods. Market volatility, on the other hand, refers to the unstable market conditions caused by declining consumer demand and the public's fear of consuming pork products during the ASF outbreak. Several respondents mentioned that even healthy pigs were difficult to sell because consumers were afraid to purchase pork products. This situation led to reduced sales and additional financial losses for the swine entrepreneurs. Studies have shown that disease outbreaks in the swine sector can significantly affect consumer confidence, leading to fluctuations in market demand and pork prices (Chenais et al., 2019). Overall, the findings indicate that the ASF outbreak created significant economic and market-related challenges for swine entrepreneurs. These challenges highlight the vulnerability of small-scale swine enterprises to animal disease outbreaks and emphasize the need for effective support systems, disease management strategies, and market stabilization efforts to help farmers sustain their livelihoods during such crises.

The theme "Strategies Employed" includes the subthemes biosecurity, strategic marketing, and collaboration. Swine entrepreneurs adopted these strategies in response to the challenges brought about by the African Swine Fever (ASF) outbreak. The findings indicate that entrepreneurs implemented various preventive, adaptive, and cooperative measures to sustain their livelihood and minimize the impact of the disease on their businesses. The first subtheme, biosecurity, refers to the preventive measures implemented to reduce the risk of ASF transmission within farms. These measures include sanitation practices, farm-gate disinfection, the use of protective clothing, and restricting visitors from entering the farm premises. The implementation of strict biosecurity practices is considered one of the most effective ways to prevent and control the spread of ASF. According to the Food and Agriculture Organization, strict farm biosecurity measures, such as controlled farm access, sanitation procedures, and disinfection protocols, are an essential strategy for minimizing the risk of ASF infection on pig farms (FAO, 2020).

The second subtheme, strategic marketing, highlights the adaptive business strategies employed by swine entrepreneurs to cope with financial losses during the outbreak. Some respondents adjusted their product prices, diversified their product lines, or sold alternative goods to maintain income and sustain their livelihoods. Product

diversification and price adjustments are common strategies among small-scale entrepreneurs during economic disruptions, as they help businesses remain operational despite declining demand for their primary products. Studies have shown that diversification of products and income sources helps farmers reduce financial risk during swine disease outbreaks (Dione et al., 2020).

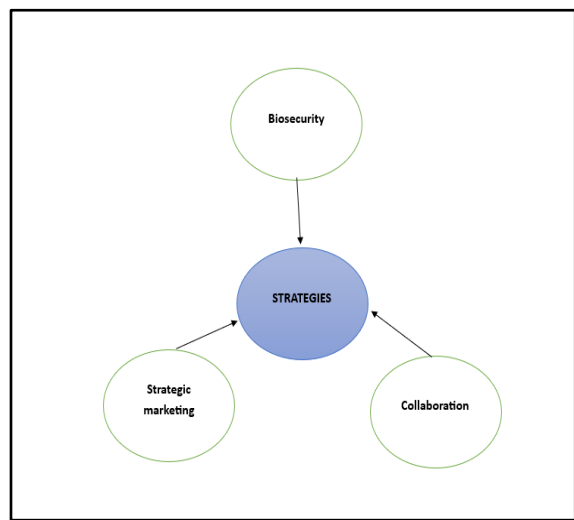
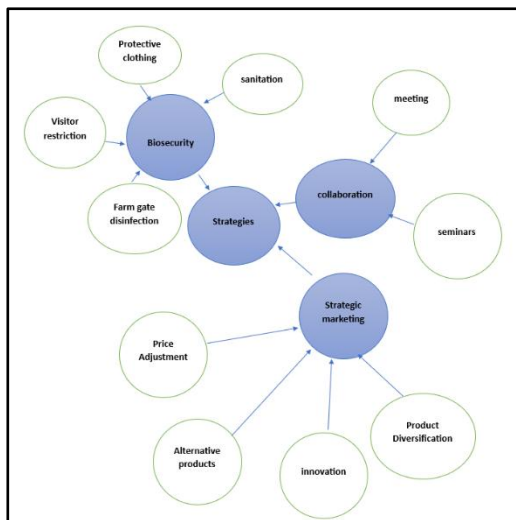


Figure 1. Initial Thematic Map of Strategies Employed by the Swine Entrepreneurs

Figure 2. Final Thematic Map of Strategies Employed by the Swine Entrepreneurs

The third subtheme, collaboration, reflects the importance of cooperation among swine entrepreneurs, government agencies, and other stakeholders in addressing the ASF crisis. Respondents mentioned attending meetings and seminars and coordinating with local authorities and fellow farmers to obtain information and guidance regarding ASF prevention and control. Collaboration and knowledge sharing are crucial for managing swine diseases, as they help farmers adopt appropriate control measures and improve their preparedness during outbreaks. According to the World Organization for Animal Health, cooperation among farmers, veterinary authorities, and local governments plays a significant role in strengthening disease control measures and improving the resilience of swine industries during disease outbreaks.

Table 2
Profile of Swine Entrepreneurs in terms of Number of Pigs, Location, and Capitalization (n=310)

	Number of Pigs	Frequency	Percent
3 – 8		47	15.2
9 – 14		112	36.1
15 – 20		108	34.8
21 – 26		37	11.9
27 – 32		6	1.9
Location			
Paluan		12	3.9
Abra de Ilog		26	8.4
Mamburao		41	13.2
Sta. Cruz		38	12.3
Sabluyan		25	8.1
Calintaan		21	6.8
Rizal		46	14.8
San Jose		54	17.4
Magsaysay		47	15.2
Capitalization			
Below P100,000		64	20.6
P100,000-P349,999		242	78.1
P350,000-P599,999		1	0.3
P600,000-P849,999		2	0.6

Number of Pigs	Frequency	Percent
3 – 8	47	15.2
9 – 14	112	36.1
P850,000-P1,100,000	1	0.3
Total	310	100.0

Table 2 presents the profile of swine entrepreneurs in terms of the number of pigs they raise, location, and Capitalization. Of the 310 respondents, the majority raised 9–14 pigs, accounting for 112 respondents (36.1%). The results suggest that swine production among the respondents is largely small-scale, possibly due to limitations in capital, space, and production resources. This pattern is consistent with the findings of Delsart et al. (2020), who reported that pig farming systems vary widely in herd size, ranging from small farms with fewer than 10 pigs to large commercial operations with thousands of animals. Their study also emphasized that production systems differ in terms of housing conditions and management practices, which can influence the number of pigs raised on a farm.

The findings of the present study also support the observations of the Food and Agriculture Organization (2018) and Thornton (2020), who noted that in many developing countries, pig production is commonly practiced by smallholder farmers who raise fewer than 10-20 pigs. These small herd sizes are often integrated with household livelihood activities and serve as an additional source of income and food security for rural families. This situation may explain why most respondents in the present study fall into the lower herd-size categories. Furthermore, Lapar et al. (2014) explained that herd size in Southeast Asian pig farming systems is largely influenced by farmers' production objectives, available labor, and financial capacity. Many smallholder farmers maintain relatively small pig populations due to limited resources and capital investment. Despite their small scale, these farms continue to contribute significantly to local pork production and rural economies. In addition, Maksym et al. (2022) emphasized that the number of pigs raised in a farm directly affects production efficiency and profitability. Their study suggested that optimizing herd size according to available resources, technological capacity, and market conditions can improve the economic performance of pig enterprises. This implies that swine entrepreneurs may adjust the number of pigs they raise depending on their financial capability and management capacity. Overall, the results of this study confirm that the majority of swine entrepreneurs operate small-scale pig farming enterprises, which aligns with previous studies indicating that available resources, management capacity, and economic conditions generally limit herd size in developing regions.

In terms of location, the largest number of respondents came from San Jose, with 54 (17.4%). The findings indicate that swine entrepreneurs are distributed across different municipalities of Occidental Mindoro, with a greater concentration in San Jose, Magsaysay, and Rizal. This distribution may be influenced by the availability of agricultural land, access to markets, and the presence of farming communities where swine production is common. These municipalities are known for their agricultural activities, which may provide favorable conditions for swine production. The results support the observations of Villanueva and Sulabo (2018), who reported that raising native pigs is commonly practiced by small-scale farmers as a supplementary source of income and food for household consumption. Similarly, Ordanel et al. (2024) noted that studies on the profile and production practices of native pig entrepreneurs highlight their important role in supporting rural livelihoods and local economies. The presence of swine entrepreneurs across different municipalities suggests that pig raising remains an accessible livelihood for rural households. In addition, the traditional nature of pig production described by Falculan (2021) may also explain the widespread distribution of pig entrepreneurs across rural areas. The study noted that many native pig farms are located in upland or rural communities, where pigs are raised in simple housing structures and fed locally available feed. Such conditions make pig raising suitable for areas with limited capital and infrastructure. Overall, the results indicate that swine entrepreneurs in Occidental Mindoro are widely distributed across municipalities, with higher concentrations in areas where agricultural activities are more prominent. This pattern supports previous studies, which suggest that pig raising is commonly practiced in rural communities as a small-scale livelihood supported by family knowledge, local resources, and traditional management practices.

In terms of capitalization, of the 310 respondents, the majority reported ₱100,000–₱349,999, accounting for 242 respondents (78.1%). These results indicate that most swine entrepreneurs in the study operate with moderate to low levels of capital investment, suggesting that pig farming in the area is largely small-scale. The findings support the study of Dela Cruz and Dela Cruz (2019), which reported that swine entrepreneurs in the Philippines commonly operate backyard piggery enterprises with capital investments ranging from ₱50,000 to ₱200,000. Their study emphasized that many pig farmers rely on personal savings or small loans to finance their operations, highlighting the relatively low capital required to start small-scale swine production. This is consistent with the present study, where the majority of respondents reported capitalization within a similar range. The results are also comparable with findings from other countries where smallholder pig farming is common. Nguyen et al. (2020) found that swine entrepreneurs in Vietnam typically invest VND 50–200 million (approximately USD 2,000–8,500) in pig farming operations. These investments are often supported by family resources, government subsidies, or cooperative systems, allowing farmers to gradually expand their production capacity. Similarly, Ouma et al. (2018) reported that pig farmers in Kenya typically operate with capital investments ranging from KES 100,000 to 500,000, often obtained from savings or profits from crop farming. Their study highlighted that pig farming in rural areas is often integrated with other agricultural enterprises to sustain operations despite limited financial resources. Overall, the findings suggest that the majority of swine entrepreneurs in the study area operate small to medium-scale piggery enterprises with limited financial resources. This pattern is consistent with previous studies indicating that swine production in developing countries is commonly practiced by smallholder farmers who rely on modest capital investment, family labor, and locally available resources to sustain their operations.

Table 3 presents the mean extent of challenges encountered by swine entrepreneurs and presents the overall level of difficulties experienced by the respondents in operating their swine enterprises. The table shows that the overall mean is 3.81, which is interpreted as High. This indicates that swine entrepreneurs generally experience significant challenges in managing and sustaining their businesses. The high overall mean suggests that various external and operational factors strongly affect the stability and performance of swine enterprises. Among the indicators, market volatility obtained the highest composite mean of 3.84, interpreted as High. This finding indicates that fluctuations in market prices and unstable demand greatly affect swine entrepreneurs. Changes in the prices of feeds, swine products, and other production inputs may create uncertainty for farmers and make it difficult for them to plan their production and financial strategies. This implies that many swine entrepreneurs are vulnerable to sudden changes in the market environment, which can reduce profitability and increase the risk of financial losses.

Table 3
Mean Extent of the Challenges Encountered by the Swine Entrepreneurs in terms of Market Disruption and Market Volatility

Financial Constraint	Weighted Mean	Interpretation
1. My income from swine raising significantly decreased during the ASF outbreak.	4.32	Very High
2. I experienced difficulty purchasing feeds, medicine, and other farm inputs.	3.65	High
3. I was unable to reinvest in pig production after ASF due to financial losses.	3.85	High
4. I relied on loans or credit to sustain my farming operations.	3.15	Moderate
5. I did not receive sufficient financial assistance from the government or private sector.	3.56	High
6. The ASF outbreak greatly affected my ability to recover my capital.	4.01	High
Composite Mean	3.76	High
Market Disruption		
1. The ASF outbreak restricted my ability to transport and sell pigs.	3.77	High
2. Quarantine checkpoints made it difficult to access markets and buyers.	3.91	High
3. There was a sudden decline in consumer demand for pork products.	3.89	High
4. I encountered unstable or fluctuating pork prices in the market.	3.83	High
5. The movement restrictions led to the loss of my regular customers.	3.81	High
6. I experienced delays or cancellations of deliveries due to ASF restrictions.	3.80	High
Composite Mean	3.83	High

Market Volatility		
1. Pork prices were unstable and changed unpredictably during the ASF outbreak.	3.91	High
2. The unstable prices made it difficult to plan my farm operations.	3.90	High
3. I faced losses because of fluctuating feed and supply costs.	3.87	High
4. The uncertainty in market prices caused financial stress.	3.82	High
5. Volatile pork prices discouraged me from restocking my farm.	3.68	High
Composite Mean	3.84	High
Overall Mean	3.81	High

Scale: 4.20-5.00 Very High; 3.40-4.19 High; 2.60-3.39 Moderate; 1.80-2.59 Low; 1.00-1.79 Very Low

Meanwhile, market disruption recorded a composite mean of 3.83, also interpreted as High. This result suggests that disruptions in the supply chain, transportation, and distribution of swine products are common among respondents. Events such as disease outbreaks, movement restrictions, and reduced consumer demand can interrupt the normal flow of production and marketing activities. These disruptions may lead to delays in selling swine products, reduced income, and additional operational costs for farmers. Similarly, financial constraint obtained a composite mean of 3.76, which is likewise interpreted as High. This indicates that limited financial resources remain a major challenge for swine entrepreneurs. Farmers often face difficulties in securing sufficient capital for feeds, veterinary services, housing, and other production requirements. Limited access to financial support, loans, or credit facilities may also hinder their ability to expand their operations or recover from losses caused by external factors such as disease outbreaks and market instability.

Several studies in the literature support the study's findings. According to Hamilton et al. (2018), swine farmers face significant financial challenges during disease outbreaks, particularly due to production losses, restrictions in animal movement, and reduced market demand. These conditions often lead to decreased income and financial instability among swine entrepreneurs. Similarly, Brown et al. (2024) emphasized that disease outbreaks and market disruptions increase production costs and require farmers to invest in additional biosecurity and disease-control measures, further straining their financial resources. Furthermore, Plavšić et al. (2019) explained that disruptions in the swine sector can affect the entire supply chain, leading to price fluctuations and market instability. These changes can create uncertainty for farmers and increase risk in swine production. In addition, You (2021) highlighted that market volatility and disease-related disruptions significantly influence the economic performance of the swine industry, affecting both production levels and market supply. Overall, the results indicate that financial constraints, market disruption, and market volatility are major challenges experienced by swine entrepreneurs. The consistently high mean scores across all indicators suggest that these challenges significantly influence the sustainability, profitability, and growth of swine enterprises. Addressing these issues may require improved financial support, stable market systems, and stronger disease management and supply chain strategies to help swine entrepreneurs maintain and expand their operations.

Table 4
Mean Extent of Strategies in terms of Collaboration, Biosecurity, and Strategic Marketing

Collaboration	Weighted Mean	Interpretation
1. I participated in meetings or discussions with other farmers to share information.	3.50	High
2. I coordinated with local government or veterinary officers during the ASF outbreak.	3.70	High
3. I received support or assistance from cooperatives or farmer groups.	2.92	Moderate
4. I joined community programs related to ASF recovery or livelihood.	3.19	Moderate
5. Collaboration with other farmers helped me recover from ASF impacts.	3.32	Moderate
Composite Mean	3.32	High
Biosecurity		
1. I implemented disinfection measures to prevent ASF spread on my farm.	3.64	High
2. I controlled the entry of visitors and vehicles into my farm.	3.45	High
3. I isolated or quarantined sick pigs immediately.	3.77	High
4. I properly disposed of dead pigs or waste materials.	3.89	High
5. I regularly monitored the health condition of my pigs.	4.01	High
6. I attended trainings or orientations about ASF prevention and control.	3.60	High
Composite Mean	3.73	High

Strategic Marketing		
1. I explored new markets or alternative buyers for my pork products.	3.74	High
2. I adjusted the prices of my products to attract buyers during ASF.	3.68	High
3. I created or sold value-added products such as longganisa or tapa.	2.89	Moderate
4. I used online platforms or social media to sell pork products.	3.28	Moderate
5. I offered discounts or promotions to maintain customer loyalty.	3.42	High
6. I applied innovative marketing practices to sustain income despite ASF.	3.47	High
Composite Mean	3.41	High
Overall Mean	3.49	High

Scale: 4.20-5.00 Very High; 3.40-4.19 High; 2.60-3.39 Moderate; 1.80-2.59 Low; 1.00-1.79 Very Low

Table 4 shows the mean extent of strategies across collaboration, biosecurity, and strategic marketing. The results show that the overall mean is 3.49, which is interpreted as High. This indicates that swine entrepreneurs generally adopted various strategies to cope with the challenges brought by the outbreak. The high overall mean suggests that farmers actively implemented measures to sustain their swine operations, protect their animals, and maintain business stability despite the disease-related risks and disruptions. Among the indicators, biosecurity obtained the highest composite mean of 3.73, interpreted as High. This finding indicates that swine entrepreneurs strongly implemented biosecurity measures in their farms during the outbreak. Such practices may include restricting farm visitors, disinfecting equipment and facilities, isolating newly purchased animals, and maintaining proper sanitation throughout the farm. The high mean suggests that farmers recognize the importance of preventive measures to control the spread of the disease and protect their swine from infection. Meanwhile, strategic marketing recorded a composite mean of 3.41, which is also interpreted as High. This implies that swine entrepreneurs employed marketing strategies to manage the effects of the outbreak on their business operations. These strategies may include adjusting pricing, identifying alternative buyers or markets, and modifying sales practices to ensure a steady income despite market disruptions. The finding suggests that farmers adapted their marketing approaches in response to changing market conditions during the crisis.

On the other hand, collaboration obtained a composite mean of 3.32, interpreted as Moderate. This indicates that although some swine entrepreneurs collaborated with fellow farmers, government agencies, and agricultural organizations, the level of cooperation was not as strong as in the other strategies. Some farmers may have limited opportunities to participate in collaborative activities, or they may rely more on individual farm management practices rather than collective action. The findings of the study are supported by several related studies, which emphasize the importance of adaptive strategies during swine disease outbreaks. According to Brown et al. (2024), farmers often strengthen biosecurity measures as a primary response to prevent the spread of diseases in swine farms. Effective biosecurity practices help reduce the risk of infection and protect animal health, thereby minimizing economic losses. Similarly, Hamilton et al. (2018) explained that swine entrepreneurs adopt various strategies, such as improving farm management practices, strengthening disease-prevention systems, and adjusting marketing approaches, to cope with the economic and operational challenges posed by disease outbreaks.

Furthermore, Plavšić et al. (2019) noted that disease outbreaks can disrupt the swine supply chain and market system, forcing farmers to adapt their marketing strategies to sustain their businesses. These adjustments may include seeking alternative distribution channels and implementing flexible selling strategies to respond to fluctuating market demand. Overall, the results indicate that swine entrepreneurs actively implemented several strategies—particularly biosecurity and strategic marketing—to mitigate the effects of the African Swine fever outbreak. While collaboration among farmers and institutions was present, it was practiced at a relatively moderate level. Strengthening cooperative efforts, together with improved disease prevention and adaptive marketing strategies, may further enhance the resilience and sustainability of swine enterprises during future disease outbreaks.

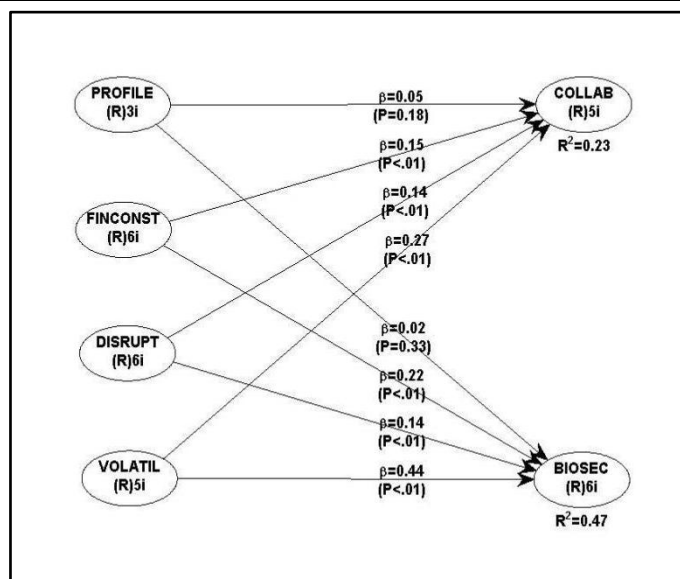


Figure 3. Structural Model of the Relationship Between Swine Entrepreneurs' Profile, Challenges Encountered, and Strategies Employed

The structural model shown in Figure 3 uses path analysis to illustrate how the swine entrepreneurs' profile and the challenges they encounter: financial constraint (FINCONS), market disruption (DISRUPT), and market volatility (VOLATIL) influence the specific strategies they adopt (endogenous variables). The impact on biosecurity practices is explained by 47% ($R^2=0.47$) of the variance in the combined challenges in market volatility, market disruption, financial constraints, and profile. Collaboration, as an important strategy, is also influenced by the challenges encountered with the model, which explains 23% of its variance ($R^2=0.23$). The model also reports beta coefficients ranging from 0.02 to 0.44, with significance levels from $p<.01$ to $p=.33$. The structural model suggests that market volatility is the most influential factor in swine entrepreneurs' adaptation of business strategies, particularly in improving biosecurity and seeking collaboration. Interestingly, the entrepreneurs' profile has less influence than that of the external market pressures they face.

Table 5

Beta Coefficients of the Paths and p-values for H_0

Paths	Beta Coefficient (β)	p-value*	Standard Error	Effect Size**	Interpretation
H₀₁: Swine Entrepreneurs' Profile→Strategies Employed (Excluded in the Emerging Model)					
H₀₂: Challenges Encountered→Strategies Employed					
FINCONS→COLLAB	0.160	0.002	.055	.056	Small
FINCONS→BIOSEC	0.215	<0.001	.055	.105	Small
DISRUPT→COLLAB	0.147	0.004	.056	.059	Small
DISRUPT→BIOSEC	0.141	0.006	.056	.079	Small
VOLATIL→COLLAB	0.264	<0.001	.055	.111	Small
VOLATIL→BIOSEC	0.441	<0.001	.053	.279	Medium

*Significant at $p<0.05$

** Effect size coefficient: 0.02 – small, 0.15 – medium, 0.30 – large

The structural model is analyzed using path coefficients and p-values to test the two hypotheses, with the results presented in Table 14. The analysis focuses on how swine entrepreneurs' profiles and the challenges they face shape their strategies in the swine industry. The path analysis reveals that while the profile of swine entrepreneurs does not significantly influence the strategies they employ, the challenges they encounter are powerful drivers of strategic adaptation. Specifically, the relationship between profile and both collaboration and biosecurity was found to be statistically non-significant. This suggests that the factors: location, capital invested, and number of pigs raised, do not dictate strategic choices employed. Conversely, all challenges that were tested: financial constraints, market disruption, and market volatility showed a significant positive impact on the strategies adopted. Market volatility came out as the strongest predictor, exerting a highly significant influence on both

collaboration and biosecurity. Furthermore, financial constraints significantly help in the adoption of biosecurity measures and collaboration. Market disruption also maintains a significant positive relationship with both strategic outcomes. The findings are supported by Hamilton et al. (2018), who emphasized that swine farmers often adjust their management practices and disease-prevention strategies in response to economic and operational challenges arising from disease outbreaks. The study explained that farmers adopt preventive and adaptive strategies to minimize losses and sustain production during periods of uncertainty.

Path analysis was employed to test the null hypotheses, H01 and H02. The first analysis supported the null hypothesis regarding the relationship between the swine entrepreneurs' profile and the strategies employed. This indicates that factors such as location, the number of pigs raised, and the amount of capital invested in the business do not significantly influence the likelihood that an entrepreneur will adopt specific collaborative or biosecurity measures. According to Mehmedi et al. (2025) in *Economic Perspectives on Farm Biosecurity: Stakeholder Challenges and swine Species Considerations*, the adoption of biosecurity practices in swine farms remains uneven across different production systems. The authors explain that the implementation of biosecurity is often influenced more by economic perceptions, behavioral attitudes, and institutional barriers than by farm characteristics such as location, herd size, or capital investment. Farmers may hesitate to adopt biosecurity measures due to perceived high costs, labor and time requirements, and uncertainty about the benefits of such practices.

In contrast, the results of the second analysis led to the rejection of the null hypothesis regarding the impact of challenges on business strategies. All tested paths were statistically significant. The findings suggest that the external environment, specifically financial pressures and market instability, is a vital component in implementing biosecurity and collaborative strategies. On the whole, these findings indicate that external industry pressures, rather than internal entrepreneurs' profiles, provide primary channels for implementing collaborative and biosecurity strategies in the swine industry. Studies in swine management show that external economic and industry pressures strongly influence farmers' strategic decisions, including the adoption of biosecurity practices. Mehmedi et al. (2024) explained that financial pressures, market uncertainties, and the perceived economic risks associated with disease outbreaks play a critical role in motivating farmers to implement biosecurity measures. Their research highlights that farmers often adopt such strategies not because of their personal characteristics, but because of external incentives, regulatory pressures, and the economic consequences of disease outbreaks in the swine sector. Similarly, Postma et al. (2016) found that biosecurity implementation among pig farmers is largely influenced by perceived disease risk, market requirements, and external advisory systems, rather than individual demographic characteristics of the farm owners. The study emphasized that disease outbreaks and industry regulations often push farmers to strengthen their biosecurity practices. In addition, Laanen et al. (2014) reported that economic risks, production losses, and external disease threats significantly affect farmers' willingness to adopt preventive strategies in pig farming. Their findings indicate that farmers respond to industry-level challenges, such as the threat of infectious diseases and market disruptions, by strengthening farm management and biosecurity systems.

Furthermore, Dione et al. (2017) observed that in smallholder pig systems, the adoption of disease control and collaborative strategies is often influenced by external environmental factors, including disease outbreaks, veterinary guidance, and market demands. These pressures encourage farmers to cooperate and implement preventive measures to protect their livelihoods. Overall, these studies support the idea that external industry pressures—such as financial constraints, market instability, and disease risks—serve as primary drivers of biosecurity and the implementation of collaborative strategies. At the same time, internal characteristics of entrepreneurs play a less significant role in shaping these decisions.

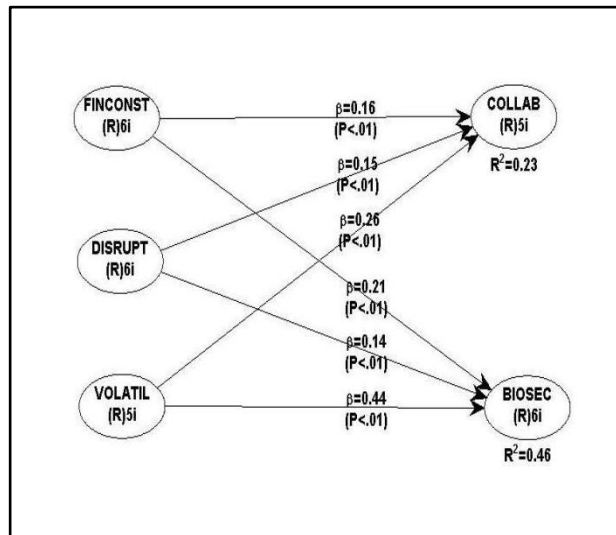


Figure 4. The Emerging Model of the Relationship Between Swine Entrepreneurs’ Profile, Challenges Encountered, and Strategies Employed

The emerging model in Figure 4 illustrates how external challenges in the swine industry influence the business strategies of swine entrepreneurs. The emerging model effectively explains a substantial percentage of the variance in the strategies employed by the entrepreneurs, a variance attributable to industry challenges. The model already removed the non-significant relationships to focus on the significant variables affecting the strategies employed in the swine industry. In terms of biosecurity, the model explains 46% of the variance (R2 = 0.46), indicating that challenges in the swine industry are major contributors to biosecurity practices. In collaboration strategies, the model explains 23% of the variance (R2=0.23) in collaborative efforts, suggesting that while challenges matter, other factors not included in the model may also influence the decision to collaborate. Notably, all significant values are less than .01, and the beta coefficients denoting the strength of the relationships ranged from 0.14 to 0.44.

Table 6

Standardized Estimates of the Path in the Emerging Model

Hypothesis	Standardized Estimates (β)	Standard Error	p-value*	Effect Coefficient**	Effect Size
Ho: Financial Literacy→Sustainable Development					
FINPLAN→DEBTPAY	0.204	0.060	<0.001	0.105	Small
FINPLAN→SOCBEN	0.119	0.061	0.026	0.041	Small
CASHMGT→BMGTDEC	0.378	0.059	<0.001	0.245	Medium
CASHMGT→DEBTPAY	0.196	0.061	<0.001	0.109	Small
CASHMGT→SOCBEN	0.229	0.060	<0.001	0.100	Small
LOANMGT→BMGTDEC	0.368	0.059	<0.001	0.238	Medium
LOANMGT→DEBTPAY	0.310	0.059	<0.001	0.178	Medium
LOANMGT→SOCBEN	0.187	0.061	<0.001	0.078	Small

*Significant at p≤ 0.05

** Effect size coefficient: 0.02 – small, 0.15 – medium, 0.30 – large

The beta coefficients of the paths shown in Table 5 identify the significant structural relationships between the challenges faced by swine entrepreneurs and the strategies they implement to sustain their businesses. In the second hypothesis test, market volatility emerged as the strongest predictor in the model, exerting a highly significant influence on biosecurity with a medium effect size of .279. It also significantly influences collaboration, suggesting that price changes and market fluctuations compel entrepreneurs to protect their business biosecurity and resource-sharing. Market disruption showed consistent significant paths to both collaboration and biosecurity. While these paths are significant, they have small effect sizes (.059 and .079), indicating they are meaningful but less dominant than volatility. Financial constraints significantly impact biosecurity and collaboration with small effect sizes of .056 and .105. In the swine industry, external challenges are significant predictors of the strategic

efforts in biosecurity and collaboration. Postma et al. (2016) emphasized that disease outbreaks and market pressures can motivate pig farmers to improve biosecurity practices and collaborate with other industry stakeholders. The authors explain that entrepreneurs often respond to external threats by strengthening preventive measures and sharing information or resources with other farmers.

Furthermore, Dione et al. (2017) observed that financial constraints and market disruptions influence smallholder farmers' decisions to adopt collaborative strategies and disease-prevention practices. Farmers facing economic pressure tend to cooperate with other entrepreneurs and adopt cost-effective biosecurity measures to reduce risks and sustain production. The statistical analysis provides sufficient evidence to reject the null hypothesis regarding the relationship between the challenges faced by swine entrepreneurs and their employed strategies, confirming that external challenges are significant drivers of the strategies employed in the swine industry. The statistical analysis provides sufficient evidence to reject the null hypothesis that there is no relationship between the challenges faced by swine entrepreneurs and the strategies they employ. The results confirm that external challenges significantly influence entrepreneurs' strategic responses in the swine industry. This finding is consistent with the study of Mehmedi et al. (2024), which emphasized that economic pressures, market instability, and disease risks strongly influence farmers' decisions to adopt biosecurity practices. Their study explained that when swine entrepreneurs face uncertain market conditions and financial risks, they tend to invest more in preventive measures to safeguard production and reduce potential economic losses.

Table 7

Proposed Program to develop strategies to prevent the impact of the African Swine Fever Outbreak

Objectives	Strategies	Budget	Persons Involved	Time Frame	Resources	Success Indicator
To strengthen awareness and knowledge of swine entrepreneurs about African Swine Fever prevention	Conduct seminars and information campaigns for swine entrepreneurs about ASF transmission, prevention, and biosecurity practices	₱300 per head	Municipal Agriculture Officer, Veterinary Officers, Barangay Officials, and swine entrepreneurs	January – February	Training materials, LGU support, and seminar venue	Increased awareness and knowledge among swine entrepreneurs about ASF prevention
To improve farm biosecurity measures in swine farms	Conduct workshops and farm visits to demonstrate proper sanitation, disinfection, and waste management practices	₱300 per head	Veterinary Officers, Agriculture Technicians, and Swine Farm Owners	February – March	Disinfectants, protective equipment, and training guides	Improved biosecurity practices implemented in swine farms
To establish an early detection and reporting system for ASF cases	Develop a reporting system where farmers can immediately report suspected ASF cases to the LGU or veterinary office	₱300 per head	LGU Officials, IT Personnel, Veterinary Office, Barangay Officials	March	Communication tools, reporting forms, and mobile communication platforms	Faster reporting and response to suspected ASF cases
To support affected swine entrepreneurs and minimize economic losses	Provide assistance programs such as financial aid, alternative livelihood training, and access to government support programs	₱300 per head	LGU, Department of Agriculture, Veterinary Office, swine entrepreneurs	April	Government funds, training materials, and a partnership with the DA	Reduced economic impact on swine entrepreneurs affected by ASF

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To strengthen coordination among government agencies in controlling the ASF outbreak	Conduct coordination meetings and planning workshops among the LGU, DA, veterinary offices, and farmer groups	₱300 per head	LGU Officials, Department of Agriculture, Veterinary Office, Farmer Associations	Quarterly	Meeting venues, coordination plans, and program guidelines	Improved collaboration and faster response to ASF outbreaks
To promote sustainable swine farming practices	Provide mentoring programs and training on improved swine farming systems and disease prevention techniques	₱300 per head	Agriculture Officers, Veterinary Experts, and Swine Farmers	May – June	Training modules, farm demonstration areas	Adoption of sustainable and disease-resistant swine farming practices

The proposed program aims to strengthen the capacity of swine entrepreneurs to prevent, detect, and respond to African Swine fever (ASF) through education, improved biosecurity practices, coordinated reporting systems, and economic support initiatives. African Swine fever is a highly contagious viral disease that affects domestic and wild pigs and can cause serious economic losses in the swine industry. It is considered a highly consequential foreign animal disease that threatens pork production and supply chains in many countries (Cochran, 2023). Because there is currently no effective vaccine for ASF, prevention through strict biosecurity and disease awareness remains the most effective strategy for controlling the virus's spread (Aliro et al., 2022). One of the program's major components is to strengthen swine entrepreneurs' awareness and knowledge of ASF prevention. Seminars and information campaigns were conducted to educate farmers about ASF transmission, symptoms, and preventive practices. Municipal agriculture officers, veterinary personnel, and barangay officials facilitate these activities. Educational outreach is important because farmers and stakeholders play a key role in preventing disease outbreaks through proper farm management and disease preparedness programs (Cochran, 2023). Providing accessible and practical knowledge helps swine entrepreneurs recognize the importance of early prevention and responsible animal management. The second component of the program focuses on improving farm biosecurity practices. Workshops and farm visits were conducted to demonstrate proper sanitation procedures, disinfection practices, waste management, and controlled access to pig farms. Veterinary officers and agriculture technicians will guide swine entrepreneurs in implementing practical biosecurity measures that minimize the risk of disease transmission. Biosecurity has been widely recognized as the most important preventive measure in ASF control, especially in the absence of an effective vaccine (Aliro et al., 2022). Implementing proper hygiene practices, restricting animal movement, and ensuring safe carcass disposal are essential strategies in preventing the spread of the virus. Another important component of the program is the establishment of an early detection and reporting system for ASF cases. The system will allow farmers to quickly report suspected ASF cases to the local government unit or veterinary office using communication tools and reporting forms. Early reporting is essential to ensure rapid response and containment measures to prevent further spread of the disease. According to Cochran (2023), unmonitored animal movement and inadequate disease reporting can contribute to the rapid spread of ASF within the swine industry.

The program also aims to provide support for swine entrepreneurs affected by ASF outbreaks. Assistance programs, including financial aid, access to government support services, and alternative livelihood training, are provided to help farmers recover from economic losses. Economic constraints and livelihood priorities often prevent farmers from implementing strict biosecurity measures, especially in small-scale farming communities (Aliro et al., 2022). Providing support programs can help reduce these barriers and encourage farmers to adopt improved disease prevention practices. In addition, the program seeks to strengthen coordination among government agencies and farmer organizations in controlling ASF outbreaks. Regular coordination meetings and planning workshops are conducted among the Local Government Unit, the Department of Agriculture, the veterinary offices, and the farmer associations. Effective collaboration among these stakeholders is essential to

ensure timely responses, effective information sharing, and coordinated disease control strategies. Finally, the program promotes sustainable swine farming practices through mentoring and training programs. Agriculture officers and veterinary experts will provide guidance on improved pig management systems and disease prevention techniques. Strengthening farmers' knowledge and practices can enhance farm resilience and help protect the swine industry from future disease outbreaks.

4. Conclusions

Based on the study's findings, the following conclusions were drawn: Swine entrepreneurs faced significant challenges during the ASF outbreak, particularly financial losses, movement restrictions, and disruptions to the pork market. The majority of swine entrepreneurs operate on a small- to medium-scale, indicating that most farmers rely on pig raising as a livelihood rather than as a large commercial enterprise. Profile of swine entrepreneurs: The findings indicate that most swine entrepreneurs operate with a limited number of pigs, suggesting that the majority of respondents are engaged in small-scale or backyard swine production systems. This reflects the common structure of pig farming in rural areas, where farmers manage a small herd primarily for livelihood and local market supply. The results show that swine entrepreneurs are distributed across several municipalities, with higher concentrations in San Jose, Magsaysay, and Rizal. This indicates that swine production is an important agricultural activity in different areas of the province and contributes to the local economy and food supply. The findings reveal that most swine entrepreneurs are from small- to medium-scale swine enterprises. This suggests that many farmers rely on limited financial resources in maintaining their swine production. Extent of the challenges encountered by the swine entrepreneurs: The findings show that swine entrepreneurs faced significant financial constraints during the African Swine Fever outbreak, as increased production costs, pig mortality, and reduced income significantly affected their ability to sustain their operations. The results indicate that swine entrepreneurs encountered considerable market disruptions, particularly due to restrictions on the movement of pigs and pork products, which limited their ability to sell and distribute their swine. The findings reveal that swine entrepreneurs were significantly affected by market volatility, as fluctuations in pork prices and unstable market demand created uncertainty and financial risks during the ASF outbreak. Extent of the strategies employed by the swine entrepreneurs during the African Swine fever outbreak: The results show that swine entrepreneurs practiced collaboration with fellow farmers, local authorities, and agricultural agencies to share information, resources, and support in managing the challenges brought about by the ASF outbreak. Swine entrepreneurs implemented biosecurity measures to prevent the spread of the disease, including improving farm sanitation, restricting farm visitors, and adopting enhanced disease-prevention practices. The results reveal that swine entrepreneurs adopted strategic marketing approaches, such as adjusting selling methods, exploring alternative markets, and more carefully managing production and sales, to cope with market challenges during the ASF outbreak. There is a significant relationship between the challenges encountered and the strategies employed, indicating that farmers develop and adopt strategies in response to these difficulties. The profile of swine entrepreneurs influences the strategies they employ, suggesting that farm size, resources, and location may affect how farmers respond to crises. There is a need to develop programs that support farmers through training, financial assistance, and improved marketing opportunities to strengthen the resilience of the swine industry.

Recommendations - Based on the findings and conclusions of the study, the following recommendations are proposed: The Department of Agriculture (DA), through the Bureau of Animal Industry (BAI), together with the Local Government Units (LGUs), may strengthen support programs for swine entrepreneurs by providing financial assistance, recovery programs, and technical guidance to help farmers cope with the financial losses and market disruptions caused by African Swine Fever (ASF). The Department of Agriculture, in coordination with the Agricultural Training Institute (ATI) and the Technical Education and Skills Development Authority (TESDA), may expand training programs and livelihood support initiatives to assist small- and medium-scale swine entrepreneurs in improving farm management practices, increasing productivity, and sustaining pig production as a stable source of income. Profile of Swine Entrepreneurs: The Department of Agriculture and Local Government Agricultural Offices may strengthen programs supporting small-scale swine production by providing technical

assistance, access to improved pig breeds, and training in better farm management practices to enhance productivity and sustainability among swine entrepreneurs with limited herd sizes. Municipal Local Government Units, particularly the Municipal Agriculture Office, may intensify area-based agricultural support programs in municipalities with active swine production to ensure equitable access to veterinary services, farmer training, and disease monitoring systems. Government financial institutions such as the Land Bank of the Philippines and the Development Bank of the Philippines, in partnership with the Department of Agriculture, may expand credit facilities, swine insurance programs, and livelihood assistance to help swine entrepreneurs improve their capital capacity and sustain their farming operations. Extent of the Challenges Encountered by the Swine Entrepreneurs: The Department of Agriculture and the Philippine Crop Insurance Corporation (PCIC) may enhance financial assistance programs, subsidy initiatives, and swine insurance coverage to help swine entrepreneurs manage production costs and recover from economic losses caused by disease outbreaks. The Department of Trade and Industry (DTI), in coordination with the Department of Agriculture and Local Government Units, may strengthen coordination with pork market stakeholders to maintain stable distribution channels for pork products even during disease outbreaks or movement restrictions. The Department of Agriculture and the Department of Trade and Industry may implement market stabilization initiatives, price monitoring systems, and improved market information dissemination to help swine entrepreneurs make informed production and marketing decisions.

Extent of the Strategies Employed by the Swine Entrepreneurs during the African Swine Fever Outbreak: Local Government Units and the Department of Agriculture may encourage the formation and strengthening of swine farmer associations or cooperatives to promote collaboration, information sharing, and collective support among swine entrepreneurs. The Bureau of Animal Industry, in coordination with Local Veterinary Offices, may implement continuous training programs on biosecurity practices, disease prevention, and farm sanitation to enhance swine farmers' preparedness for future outbreaks. The Department of Trade and Industry and the Department of Agriculture may provide capacity-building activities on strategic marketing, product diversification, and the development of value-added pork products to help swine entrepreneurs sustain their income despite market disruptions. The Department of Agriculture and the Bureau of Animal Industry should provide adaptive, challenge-based training programs to help farmers respond effectively to issues such as disease outbreaks and rising costs. LGUs and the Land Bank of the Philippines, with support from the Department of Trade and Industry, may offer profile-based assistance (financial, technical, and technological) tailored to the size and capacity of swine farmers. The Department of Agriculture, the Agricultural Training Institute, the Philippine Crop Insurance Corporation, and the Department of Trade and Industry may collaborate to deliver integrated support programs that cover training, financial aid, insurance, and market access. Future researchers may conduct further studies focusing on long-term recovery strategies and the effectiveness of government support programs in strengthening the resilience of the swine industry.

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Rice Competitiveness Enhancement Fund (RCEF) mechanization and the financial impact on the farmers

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Abstract

This study investigated the benefits of the Rice Competitiveness Enhancement Fund (RCEF) Mechanization and financial impact on rice farmers in Rizal and Occidental Mindoro, focusing on mechanization and capacity-building. Utilizing an exploratory sequential research design, a total of 243 rice farmers served as respondents, with primary data collected through in-depth interviews and validated questionnaires analyzed using thematic coding and statistical measures. Findings indicate that the program yielded very high benefits, enhancing farm productivity, operational efficiency, and technical competence. Financial outcomes were similarly significant, demonstrating notable reductions in production costs and increases in farmers' income. Correlational analysis further revealed that mechanization strongly influences financial performance, while capacity-building contributes significantly to operational effectiveness. Based on these insights, recommendations include establishing cooperative-based machinery management systems, sustaining technical training programs, implementing digital monitoring mechanisms, and strengthening coordination among farmers' cooperatives, local government units, and agencies such as PhilMech and the Agricultural Training Institute. The results provide evidence-based guidance for policymakers, practitioners, and future researchers seeking to improve the efficiency, sustainability, and economic resilience of rice farming through targeted mechanization and capacity-building interventions.

Keywords: Rice Competitiveness Enhancement Fund (RCEF), mechanization, financial impact, enhancing farm productivity, operational efficiency

Rice Competitiveness Enhancement Fund (RCEF) mechanization and the financial impact on the farmers

1. Introduction

The agricultural sector is a cornerstone of the Philippine economy, contributing approximately 10% to the country's Gross Domestic Product (GDP) and employing around 25% of the labor force (Philippine Statistics Authority, 2023). Within this sector, farmer associations and cooperatives play a crucial role in enhancing productivity, facilitating access to resources, and improving market competitiveness for smallholder farmers. These entities serve as vital support systems, enabling farmers to pool resources, share knowledge, and access markets more effectively. However, they often face significant challenges, including limited access to modern agricultural technology, inadequate financial resources, and insufficient training and capacity-building opportunities (Agustin et al. 2021).

The Philippines is characterized by a diverse agricultural landscape, with rice being a staple crop and a primary source of livelihood for millions of Filipinos. The country ranks among the world's largest rice importers, underscoring the need to increase domestic production to achieve food security and self-sufficiency (Philippine Statistics Authority, 2023). The reliance on traditional farming methods has led to low productivity, making it imperative to modernize the agricultural sector through mechanization and technological advancements. The introduction of modern machinery and equipment is essential for improving efficiency, reducing labor costs, and increasing crop yields.

To address these challenges, the Philippine government established the Rice Competitiveness Enhancement Fund (RCEF) Mechanization Program in 2019, as part of the Rice Tariffication Law. The program aims to modernize the rice farming sector by providing financial support for acquiring modern machinery and equipment, thereby enhancing the operational capabilities of farmer associations and cooperatives (Department of Agriculture, 2021). The RCEF Mechanization Program is particularly relevant in regions such as Rizal and Occidental Mindoro, where rice farming is a primary source of income for many households. In these areas, mechanization can significantly improve productivity and reduce labor costs (Lahaylahay & Tongol, 2025). Research indicates that agricultural mechanization can lead to substantial improvements in productivity. For instance, a study by Villanueva et al. (2020) found that the introduction of modern machinery led to an average 20% increase in yield among farmer cooperatives in the region. This increase in yield is critical to enhancing food security and improving farmers' livelihoods. Additionally, the study highlighted that mechanization reduced the time required for land preparation and harvesting, allowing farmers to allocate their labor more efficiently. Furthermore, Avila et al. (2025) emphasized the role of cooperatives in facilitating access to technology and financial resources, which are critical for the successful adoption of mechanization.

The RCEF Mechanization Program not only aims to enhance productivity but also to empower farmer associations and cooperatives by providing them with the tools and resources needed to thrive in a competitive agricultural landscape. By investing in modern machinery, the program aims to foster an environment in which smallholder farmers can increase their production capacity, improve their incomes, and ultimately contribute to the overall economic development of their communities (Arbes et al., 2024).

In addition to the economic benefits, the RCEF Mechanization Program is expected to have social implications, such as improving the quality of life for farmers and their families. By reducing the physical labor associated with traditional farming practices, mechanization can lead to better working conditions and increased time for education and community engagement. Moreover, the program aligns with the government's broader goals of promoting sustainable agricultural practices and enhancing resilience to climate change. In conclusion, this study begins with a national perspective—anchored in the legal and developmental vision of Republic Act 11203, which seeks to

modernize the rice sector through mechanization—and narrows to a local perspective, focusing on how these reforms unfold in Rizal, Occidental Mindoro. By examining the real impact of RCEF mechanization on the ground, this study bridges the gap between policy and practice, ensuring that modernization is not only a national goal but also a lived reality for local farmers. Ultimately, the study aspires to contribute toward a more inclusive, efficient, and sustainable rice industry—one that empowers even the smallest farming communities to become truly competitive in the modern agricultural economy.

Statement of the Problem - This study aimed to determine the Rice Competitiveness Enhancement Fund (RCEF) Mechanization and its financial impact on the farmer-members of cooperatives in the Municipality of Rizal, Occidental Mindoro. Specifically, this study sought to answer the following questions: (1) What are the benefits of implementing the Rice Competitiveness Enhancement Fund (RCEF) for farmers in Rizal, Occidental Mindoro? (2) What is the extent of the benefits of implementing the RCEF program for farmers in terms of Mechanization and Capacity Building? (3) What is the level of the financial impact of the RCEF program on the farmers in terms of Production costs, income, and Rice Extension Services? (4) Is there a significant relationship between the extent of the benefits in implementing the RCEF Program and its financial impact on the farmers in terms of Production costs, income, and Rice Extension Services? (5) What programs can be applied to sustain the RCEF Mechanization Program?

Significance of the Study - This study is of considerable importance, as it examines the socio-economic and financial implications of the Rice Competitiveness Enhancement Fund (RCEF) Mechanization Program within the farming sector. By grounding its analysis on actual field conditions, the study provides meaningful insights into how mechanization shapes productivity, cost efficiency, and income stability among farmers. For individual farmers, the findings provide a practical basis for assessing whether and how mechanized interventions translate into tangible improvements in farm operations and household welfare and for identifying areas where further support may be necessary to reduce production costs and enhance profitability. For Farmer Cooperatives and Associations (FCAs), the study serves as a reflective tool to evaluate their participation and operational effectiveness in delivering mechanization services. It highlights opportunities to strengthen institutional arrangements, improve resource management, and sustain shared services that can amplify collective gains. In the context of local governance, the Municipal Local Government Unit (MLGU) of Rizal, Occidental Mindoro, may use the study's findings as an empirical basis to design more responsive and targeted agricultural support programs. This includes the potential integration of complementary interventions through local policies that address gaps in access, financing, and technical support for smallholder farmers.

At the program implementation level, the Philippine Center for Postharvest Development and Mechanization may benefit from the study as it provides grounded feedback on the actual performance and reach of mechanization initiatives, particularly in assessing whether intended outcomes are realized at the community level. Similarly, the Agricultural Training Institute may draw on the study to evaluate the effectiveness of its capacity-building efforts, particularly to ensure that farmers and cooperatives possess the technical competence to maximize the benefits of mechanization. More broadly, the study contributes to the continuing discourse on agricultural modernization and rural development by identifying persistent constraints and emerging opportunities within mechanization programs. It underscores the need for a more integrated approach that aligns technology provision with institutional support and capacity development. For future researchers, this study provides a relevant reference point for further inquiry into agricultural mechanization, policy evaluation, and rural transformation, offering both empirical data and contextual insights that can inform subsequent studies. Ultimately, the study aspires to support the development of a more efficient, inclusive, and resilient agricultural sector.

Scope and Delimitation of the Study - This study centers on the Rice Competitiveness Enhancement Fund (RCEF) Mechanization Program and its financial implications for cooperative farmer-members in the Municipality of Rizal, Occidental Mindoro. It examines how access to mechanization support influences key economic variables—particularly production costs, farm income, and overall financial outcomes—within the context of organized farmer groups. In addition, the study considers the extent to which the program is implemented at the

local level, including the provision of machinery and the conduct of training and capacity-building activities intended for farmer-members. The study was undertaken from August 1, 2025, to February 28, 2026, a period that captures crucial stages of the rice production cycle, specifically harvest operations and land preparation for the succeeding cropping season. This timing allowed the researcher to observe how mechanization is applied in actual farm settings and to assess its immediate implications on efficiency, labor dynamics, and cost management. While this timeframe bounded data collection, respondents, in some instances, drew on prior experiences, offering a more nuanced understanding of mechanization practices over time.

To provide both depth and analytical rigor, the study adopted an exploratory-sequential research design. The qualitative phase involved in-depth interviews with 20 key informants, including cooperative leaders, farmer members, and local agricultural stakeholders, to elicit practical insights and lived experiences regarding program implementation. These narratives informed the subsequent quantitative phase, where structured survey instruments were administered across five cooperatives. The sample size was proportionally determined to ensure that farmer-members were adequately represented. This combination of approaches enabled the study to capture not only measurable trends but also the underlying realities shaping those outcomes. The study is deliberately confined to farmer members of cooperatives in Rizal and Occidental Mindoro. As such, the findings reflect the conditions, experiences, and financial outcomes specific to this group. Farmers who operate independently of cooperatives, as well as other support programs beyond mechanization, fall outside the scope of this inquiry. Similarly, the study does not attempt to conduct long-term cost-benefit analyses of mechanization investments; instead, it focuses on observable financial effects within the study period.

Certain constraints are acknowledged. Limitations in time, resources, and access to complete financial records may have influenced the extent of data gathered. Differences in farm size, access to machinery, and management practices among respondents also introduce variability in outcomes. External factors—such as weather disturbances, input price fluctuations, and shifting market conditions—may have further shaped the financial results reported by farmer-members. Given these considerations, the findings should be interpreted within the specific context of Rizal and may not be directly generalized to other areas with differing agricultural and institutional environments.

2. Methodology

Research Design - This study employed an exploratory sequential design to assess the impact of the Rice Competitiveness Enhancement Fund (RCEF) Mechanization Program on farmers in the Municipality of Rizal, Occidental Mindoro. The exploratory sequential design is a mixed-method research approach in which qualitative data collection and analysis are conducted first, followed by quantitative data collection and analysis. This approach allowed the researcher to initially explore the participants' experiences and perspectives and subsequently examine the findings using quantitative data from a larger group (Creswell & Plano Clark, 2018). The research began with a qualitative exploratory phase to gain an in-depth understanding of the farmers' experiences of the mechanization program. The themes and insights from the survey formed the basis for identifying key variables used in the quantitative phase to measure the extent and impact of the RCEF Program.

Respondents of the Study - The study respondents consisted of officers and members of Farmer Cooperatives and Associations (FCAs) who were direct beneficiaries of the RCEF Mechanization Program. For the qualitative phase, twenty (20) key participants were purposively selected from the list of trial respondents, including cooperative leaders, machine operators, and local agricultural stakeholders, to obtain a broad range of perspectives and experiences related to mechanization, training, and farm operations. For the quantitative phase, a sample size of 243 respondents was determined using the Raosoft sample size calculator to ensure adequate representation of the population. The target population consisted of 618 cooperative officers and farmer-members who were directly involved in mechanized rice production and post-harvest activities across RCEF-assisted cooperatives in the Municipality of Rizal, Occidental Mindoro. A 95% confidence level and a 5% margin of error were applied in the computation, with a 50% response distribution used to maximize the reliability of the sample size.

Research Instrument - To generate a comprehensive assessment of the Rice Competitiveness Enhancement Fund (RCEF) Mechanization Program, this study utilized both qualitative and quantitative research instruments consistent with its exploratory-sequential design. For the qualitative phase, an approved interview guide consisting of one open-ended question was administered to twenty (20) selected participants, including farmer-members, cooperative officers, and key agricultural stakeholders. This enabled the respondents to articulate their experiences, insights, and observations regarding the implementation of mechanization interventions and their corresponding financial implications. The responses were analyzed using thematic analysis to identify recurring patterns and to establish core themes relevant to the study. The variables explored in this phase focused on access to and utilization of mechanization, capacity-building experiences, and perceived financial outcomes.

For the quantitative phase, a researcher-developed questionnaire was used to systematically collect data from farmer members. The instrument was structured into two main parts. The first part focused on the level of implementation of the RCEF Mechanization Program, particularly regarding mechanization support and capacity-building initiatives. The second part examined the program's financial impact, specifically regarding production costs, income, and rice extension activities. Each construct was represented by multiple indicators designed to capture the breadth of program effects on farm operations and economic performance. Respondents were asked to rate each item using a four-point Likert scale: (4 – Strongly Agree; 3 – Agree; 2 – Disagree; 1 – Strongly Disagree). To ensure consistency in interpretation, corresponding verbal descriptions were assigned to the computed mean scores: 3.25–4.00 was interpreted as Strongly Agree (Very High); 2.50–3.24 as Agree (High); 1.75–2.49 as Disagree (Low); and 1.00–1.74 as Strongly Disagree (Very Low). This scaling framework provided a clear and systematic basis for interpreting the extent of program implementation and its financial effects.

The researcher-made instrument underwent content validation by five (5) experts to ensure its relevance, clarity, and alignment with the objectives of the study. The validators included two Agricultural Extension Managers—one from the Municipal Agriculture Office of Rizal and one from the Department of Agriculture for Occidental Mindoro—as well as three faculty members from the Graduate School of Divine Word College of San Jose. Their comments and recommendations were carefully reviewed and incorporated into the final version of the questionnaire. Following validation, the researcher secured permission from the appropriate local authorities and cooperative leaders to conduct a reliability test. The questionnaire, consisting of forty (40) items distributed across five constructs—Mechanization, Capacity Building, Production Costs, Income, and Rice Extension Services—was pilot-tested among thirty (30) respondents who were not included in the final survey. The instrument was administered once, and its internal consistency was evaluated using Cronbach’s Alpha. This method was employed to determine the degree to which the items within each construct were closely related and reliably measured the intended variables. The resulting coefficients indicated acceptable levels of reliability, confirming that the instrument was suitable for full-scale data collection. The computed reliability coefficients are presented in the succeeding table.

Table 1
Result of Reliability Analysis

Indicators	Number of Items	Reliability Coefficients	Interpretation
RCEF Program			
Mechanization	8	.948	Very High Reliability
Capacity Building	8	.948	Very High Reliability
Financial Impact			
Production Costs	8	1.000	Excellent Reliability
Income	8	.934	Very High Reliability
Rice Extension Services	8	.943	Very High Reliability

**Based on Standardized Items

The scales for the five components yielded Cronbach’s Alpha values ranging from 0.934 to 0.948, indicating very high internal consistency. The standardized Alpha values also suggested that the items had similar variances and contributed effectively to the overall constructs. The Production Cost scale showed a perfect correlation, with each item correlating perfectly (1.000) with every other item. Although such perfect correlation is uncommon, it indicates that the data points for these items were identical across all respondents. Overall, all five scales

demonstrated very high internal consistency, with Cronbach's Alpha values exceeding the 0.90 threshold. This confirmed that the instrument used to collect the data was highly reliable and that the items within each scale measured the same underlying construct. Therefore, the instrument was deemed suitable for further statistical analysis.

Data Gathering Procedure - The study started with securing the necessary permit to conduct the study and gather data. The research commenced with the qualitative phase, during which the researcher obtained formal approval from the Municipal Agriculture Office (MAO) and the identified Farmers' Cooperative Associations (FCAs). In-depth interviews were conducted with selected key respondents over 2 days to generate descriptive and narrative data on the implementation and outcomes of the RCEF Mechanization Program. With the participants' consent, all interviews were audio-recorded and transcribed for thematic analysis. The insights from this phase informed the development of a structured, validated survey instrument for the quantitative phase. The survey was administered to 243 farmer-members of the cooperative by the researcher, with the assistance of the Agricultural Extension Workers of Rizal, over 15 days, face-to-face during farmers' meetings, following a brief orientation on the study's objectives and confidentiality protocols. The collected responses were encoded, organized, and subjected to appropriate statistical analyses. In the final integration phase, qualitative and quantitative results were synthesized, with emergent themes used to interpret and substantiate statistical findings, thereby providing a comprehensive and empirically grounded understanding of the impacts of the RCEF Mechanization Program.

Statistical Treatment of the Data - Thematic analysis was employed to identify and synthesize key themes related to the implementation of the Rice Competitiveness Enhancement Fund (RCEF) Mechanization Program, with a particular focus on mechanization support, capacity-building experiences, and perceived financial outcomes among farmer-members. The coded themes derived from the qualitative phase served as the basis for structuring the variables used in the quantitative analysis. The weighted mean was utilized to determine the average responses of the respondents with respect to the extent of RCEF Mechanization Program implementation, specifically in terms of mechanization and capacity building, as well as its financial impact, including production costs, income, and rice extension activities. This statistical tool enabled the researcher to assess the overall level of agreement and interpret the extent to which the program is implemented and experienced by farmer-members. To determine whether there is a significant relationship between the extent of RCEF mechanization interventions and the corresponding financial outcomes, WarpPLS version 7.0 was utilized. The Partial Least Squares Structural Equation Modeling (PLS-SEM) approach was applied to analyze the relationships among variables and to examine whether the level of program implementation significantly influences the financial outcomes of farmer-members. This method is particularly appropriate for exploratory models and allows the simultaneous analysis of multiple relationships within the study's conceptual framework.

Ethical Considerations - The researcher adhered to ethical protocols to ensure the integrity of the study. Before data collection, informed consent was obtained from all participants, ensuring that they were fully aware of the study's purpose, procedures, and their rights, including the right to participate voluntarily and to withdraw at any stage without consequence. Participants' confidentiality and anonymity were strictly maintained throughout the research process, and all information gathered was used solely for academic purposes. In compliance with the Data Privacy Act of 2012, the researcher ensured that no personal or identifiable information was disclosed. All data were handled with care, securely stored, and accessed only for this study. The instruments used, including the questionnaire and interview guide, were designed to be non-biased and gender-sensitive, ensuring fairness and respect for all respondents. Furthermore, the researcher obtained formal authorization from the appropriate local authorities to conduct the study. Permission was sought from cooperative leaders and relevant municipal agricultural offices to administer the survey questionnaires and conduct interviews among farmer-members. These steps ensured that proper protocols were observed and that the research was conducted with institutional support. These measures ensured compliance with ethical standards, upheld respect for participants, and fostered trust and cooperation among all individuals involved in this research.

3. Results and Discussions

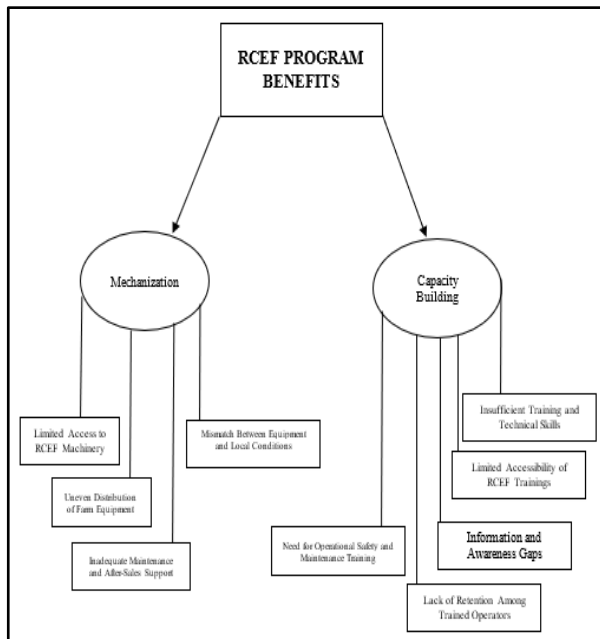


Figure 1. Initial Thematic Map of RCEF Program Benefits

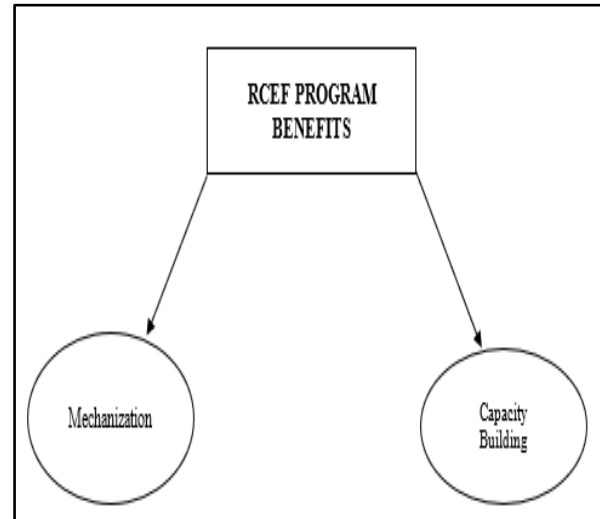


Figure 2. Final Thematic Map of RCEF Program Benefits

The initial thematic map in Figure 1 presents the consolidated insights from participants' responses on the implementation of the Rice Competitiveness Enhancement Fund (RCEF) Mechanization Program. These insights were generated from in-depth interviews guided by the question, "What are the benefits of implementing the Rice Competitiveness Enhancement Fund (RCEF) for farmers in Rizal, Occidental Mindoro? The responses were carefully transcribed, organized, and systematically coded to surface recurring patterns and shared perspectives among the participants. As shown in Figure 1, farmers consistently pointed to a range of practical benefits that can be grouped into two major areas: mechanization and capacity building. Regarding mechanization, respondents emphasized the noticeable improvement in the efficiency of farm operations. Tasks that previously required significant labor and time—particularly land preparation and harvesting—became faster and more manageable with the use of machinery. Many participants also associated mechanization with reduced dependence on manual labor and more predictable farm operations, which are critical during peak agricultural periods. On the capacity-building side, farmers highlighted the value of the training activities provided under the program. These interventions helped them better understand how to operate and maintain equipment, while also improving their overall approach to farm management. For many, the training component not only builds technical skills but also increases their confidence in adopting more modern and efficient farming practices (Mgendi et al., 2020).

Beyond operational improvements, participants also described broader economic benefits. These included perceived reductions in production costs, particularly in labor expenses, and opportunities to increase income through more efficient, timely farming activities. At the cooperative level, respondents noted better coordination in the use of shared machinery and a more structured approach to service delivery among members. These outcomes suggest that the benefits of the program are not limited to individual farmers but extend to collective farming systems. These observations are consistent with earlier findings indicating that access to mechanization, when paired with appropriate training, improves productivity and cost efficiency in rice farming. In particular, initiatives implemented through the Philippine Center for Postharvest Development and Mechanization have expanded farmers' access to machinery, supporting more efficient farm operations at the local level.

Figure 2 presents the final thematic map, which integrates qualitative insights with the survey results. The refinement of themes into mechanization, training, and capacity building reflects a clearer understanding of how

the program delivers value. Mechanization captures the direct, tangible improvements in farm operations, while training is the enabling component that allows farmers to utilize these technologies fully. Taken together, these findings suggest that the effectiveness of the RCEF Mechanization Program lies not only in the provision of equipment but also in strengthening farmers' capacity to use these resources productively. Supporting this, studies have shown that mechanization, when complemented by sustained capacity-building efforts, leads to more efficient resource use and improved farm outcomes. Hidayat (2025) underscores the importance of continuous training to ensure that technological interventions translate into long-term gains in productivity and income for smallholder farmers.

Table 2*Mean Extent of Benefits of the RCEF Program in terms of Mechanization*

Mechanization	Weighted Mean	Interpretation
The machine I use reduces the amount of heavy work.	3.80	Very High
I use tractors for farm operations.	3.75	Very High
I use a combine harvester to save labor.	3.76	Very High
I prefer a harvester to a laborer.	3.68	Very High
The mechanized technologies increase my rice yield.	3.67	Very High
The mechanized equipment I use improves the efficiency of my field operations.	3.77	Very High
7. The availability of machinery in my cooperative allows for timely farm operations.	3.74	Very High
8. Mechanization reduces my overall production cost compared with manual labor.	3.79	Very High
Composite Mean	3.74	Very High

Scale: 3.25-4.00 Very High; 2.50-3.24 High; 1.75-2.49 Moderate; 1.00-1.74 Low

The data presented in Table 2 reveal an overall mean of 3.74, interpreted as Very High, indicating that farmers strongly perceive the benefits of mechanization under the Rice Competitiveness Enhancement Fund (RCEF) program. This finding underscores that mechanization has significantly enhanced operational efficiency, labor productivity, and cost management among farmers in Rizal. More importantly, it reflects a gradual shift toward more modern, efficient farming practices, in which reliance on manual labor is reduced, and farm activities are carried out more promptly and in a more organized manner. Among the indicators, the highest ratings were recorded in the reduction of heavy labor (3.80), as well as in the use of tractors (3.75) and combine harvesters (3.76) for labor-saving purposes. These results clearly demonstrate that mechanization directly addresses one of the most pressing concerns in rice farming—labor intensity. The availability of machinery allows farmers to perform critical operations such as land preparation and harvesting more efficiently, thereby reducing physical strain and improving workflow. These findings are consistent with earlier studies, which show that modern machinery, including rice transplanters, threshers, and harvesters, significantly reduces labor requirements and enhances operational efficiency (Rahman & Salim, 2020; Magrini et al., 2018; Kumar et al., 2019).

On the other hand, the lowest-rated indicators, though still within the High category, include the preference for mechanized harvesting over manual labor (3.68) and the perceived contribution of mechanization to increased rice yields (3.67). While these are comparatively lower, they still indicate a positive perception among farmers. The slightly lower ratings suggest that some benefits, particularly those related to yield improvement, may not be immediately realized or may vary depending on farm-specific conditions. Nevertheless, other indicators, such as improved efficiency in field operations (3.77), timely completion of farm activities (3.74), and reduced production costs relative to manual labor (3.79), further reinforce the overall effectiveness of mechanization. In the Philippine context, RCEF mechanization initiatives implemented through the Philippine Center for Postharvest Development and Mechanization have expanded access to farm machinery among Farmer Cooperatives and Associations (FCAs), contributing to improved productivity and financial stability, particularly for older farmers and those managing larger farms (Arbes et al., 2024). Cooperative-based machinery management, characterized by shared access and coordinated scheduling, further enhances efficiency and reduces individual investment costs.

From a theoretical standpoint, these findings may be viewed through the lens of resilience, where farming systems adapt to external pressures and uncertainties (Darnhofer, 2021). Mechanization supports this adaptive

capacity by reducing dependence on manual labor and improving the efficiency of farm operations, enabling farmers to sustain productivity despite labor shortages, climate variability, and market disruptions. However, sustaining these benefits requires continuous technical support and capacity building to ensure the proper operation and maintenance of machinery (Alvaro et al., 2021). Financially, mechanization has been associated with reduced production costs—estimated at approximately ₱3.00 per kilogram of palay—alongside reductions in post-harvest losses of up to 5% and increases in farm income of around ₱9,000 per hectare (Arbes et al., 2024; Kim et al., 2022). Despite these gains, persistent challenges such as limited access to credit, small farm sizes, and inadequate infrastructure continue to constrain the full realization of mechanization's benefits (Lowder et al., 2025; Hassan et al., 2025). In conclusion, the consistently Very High ratings across all mechanization indicators demonstrate that the RCEF program plays a crucial role in modernizing rice production in Rizal. By integrating access to machinery, technical training, and cooperative-based management systems, the program provides a viable pathway to improved productivity, greater cost efficiency, and higher income for farmer-members.

Table 3
Mean Extent of Benefits of the RCEF Program in terms of Capacity Building

	Capacity Building	Weighted Mean	Interpretation
1.	My training enhances my knowledge of mechanized rice farming.	3.79	Very High
2.	I learned the proper way to operate farm machinery.	3.78	Very High
3.	I attend learning tutorials on the agricultural learning site.	3.75	Very High
4.	I learned how to prepare a business plan in the seminar I attended.	3.70	Very High
5.	The training programs I attend improve my decision-making in farm management.	3.73	Very High
6.	The workshops help me adopt new agricultural technologies more effectively.	3.79	Very High
7.	The technical assistance from experts improves my competence in mechanized farming.	3.78	Very High
8.	The capacity-building activities increase my confidence in implementing improved farm practices.	3.77	Very High
	Composite Mean	3.76	Very High

Scale: 3.25-4.00 Very High; 2.50-3.24 High; 1.75-2.49 Moderate; 1.00-1.74 Low

The data presented in Table 3 reveal an overall mean of 3.76, interpreted as "Very High," indicating that farmer-members strongly perceive the benefits of the Rice Competitiveness Enhancement Fund (RCEF) program for capacity building. This suggests that the program has played a critical role in enhancing not only farmers' technical competencies but also their confidence in managing mechanized rice production. In practical terms, the findings indicate that farmers are becoming better able to operate within a modernized agricultural system, where knowledge and skills are just as important as access to machinery. Among the indicators, the highest ratings were observed for the enhancement of knowledge on mechanized rice farming (3.79) and the improved adoption of new technologies through training and technical assistance. These results highlight that capacity-building interventions are not merely supplementary but are central to the effective utilization of mechanization. The ability to operate, maintain, and troubleshoot machinery directly influences productivity and reduces inefficiencies in farm operations (Van Loon et al., 2020).

On the other hand, the lowest-rated indicators—participation in seminars on business planning (3.70) and improvements in decision-making related to farm operations (3.73)—remain within the High category. This indicates that while farmers recognize the value of managerial and planning-related training, these areas may not yet be as well developed or as immediately impactful as technical training. Nevertheless, other indicators, such as participation in learning sessions (3.75) and increased confidence in applying improved farm practices (3.77), further affirm that the program contributes to the well-rounded development of farmers' capabilities. These findings are supported by the existing literature, which emphasizes that capacity building is a critical complement to mechanization initiatives. Training programs that include hands-on machinery operation, preventive maintenance, and post-harvest management significantly enhance farmers' ability to maximize the benefits of technology (Rahman & Salim, 2020). Studies also show that cooperatives that receive structured, continuous training demonstrate higher adoption rates and more efficient use of mechanized equipment (Cayetano et al., 2023; Agustin et al., 2021).

In the Philippine context, initiatives implemented by the Agricultural Training Institute, particularly the Rice Extension Services Program (RESP), provide experiential learning platforms, such as Farmer Field Schools, that promote peer-to-peer knowledge sharing and practical skill development. These interventions enhance competencies not only in mechanized operations but also in broader aspects of farm management, including pest control, nutrient management, and seed production (PhilRice, 2022). International evidence further supports the view that integrating mechanization with capacity building contributes to increased productivity, improved rural livelihoods, and stronger institutional learning systems (Nguyen et al., 2019; Cabral & Orden, 2020). Moreover, the train-the-trainer approach used in many extension programs ensures that knowledge is sustained and expanded within farming communities, as trained individuals disseminate what they have learned to other members (PhilRice, 2022). Empirical evidence from local studies, such as those conducted in Davao del Norte, shows that combining mechanization with structured training significantly enhances both productivity and income among farmers (Arbes et al., 2024). Similarly, reports from the Philippine Center for Postharvest Development and Mechanization indicate that trained farmers are better able to minimize machine downtime, reduce production costs, and lower post-harvest losses, resulting in tangible financial gains (PhilMech, 2025).

In conclusion, the consistently Very High ratings across all capacity-building indicators demonstrate that the RCEF program’s integrated approach—combining technical training, hands-on learning, and institutional support—effectively strengthens farmers’ competencies and operational confidence. More than just improving skills, these interventions enable farmers to fully utilize mechanization, enhance decision-making, and operate more efficiently within cooperative systems. As such, capacity building is a critical driver for sustaining productivity gains, improving income potential, and reinforcing the long-term resilience and competitiveness of rice farming in Rizal.

Table 4
Mean Level of Financial Impact in terms of Production Costs

Production Costs	Weighted Mean	Interpretation
1. The use of RCEF-provided machinery has lowered my production expenses per kilogram of palay.	3.79	Very High
2. Mechanized operations have reduced my production cost per hectare compared with manual practices.	3.78	Very High
3. Cooperative-operated machinery services allow me to access mechanized operations at lower rates than commercial rentals.	3.79	Very High
4. Mechanization minimizes post-harvest losses, reducing the cost impact of wastage.	3.77	Very High
5. The efficiency of mechanized services has helped me avoid additional costs associated with delays in farm operations.	3.77	Very High
6. Using cooperative-owned machines has significantly reduced my dependence on high-priced private service providers.	3.77	Very High
7. The overall decrease in production cost has improved the financial stability of my farming activities.	3.78	Very High
8. The availability of RCEF machinery within the cooperative has made my farm operations more cost-efficient.	3.79	Very High
Composite Mean	3.78	Very High

Scale: 3.25-4.00 Very High; 2.50-3.24 High; 1.75-2.49 Moderate; 1.00-1.74 Low

The data presented in Table 4 reveal an overall mean of 3.78, interpreted as "Very High," indicating that farmer-members strongly perceive the financial benefits of the Rice Competitiveness Enhancement Fund (RCEF) program in terms of reduced production costs. This suggests that mechanization has made a tangible difference in lowering farm expenses and improving cost efficiency, both at the individual farm level and within cooperative operations. In practical terms, farmers are not only spending less on key production activities but are also managing their resources more efficiently across the cropping cycle. Among the indicators, the highest ratings (3.79) were observed for the reduction in production expenses per kilogram of palay, the affordability of cooperative-operated machinery relative to commercial rentals, and the overall improvement in cost efficiency due to the availability of RCEF-supported equipment (Cayetano et al., 2023). These findings highlight how shared access to machinery through cooperatives enables farmers to avoid high service fees and benefit from more organized, cost-effective farm operations. The results indicate that mechanization not only improves productivity but also directly

contributes to better financial management among farmer-members (Takeshima et al., 2020).

Meanwhile, the lowest-rated indicators, though still within the Very High category (3.77), include reduced post-harvest losses, decreased reliance on private service providers, and avoided additional costs from delays in farm operations. While slightly lower, these results remain consistently strong, indicating that farmers continue to recognize the financial advantages of mechanization across different stages of production. The consistency of high ratings across all indicators suggests that cost-saving benefits are experienced broadly rather than in isolated aspects of farming.

These findings are supported by empirical evidence showing that mechanized operations in land preparation, planting, harvesting, and post-harvest handling significantly reduce labor-related expenses—ranging from ₱0.88 to ₱2.92 per kilogram of palay, equivalent to savings of ₱3,608 to ₱11,972 per hectare (Alvaro et al., 2021; Philippine Center for Postharvest Development and Mechanization, 2025). Cooperative-managed mechanization further ensures the timely completion of farm activities, reduces inefficiencies associated with manual labor, and minimizes unnecessary operational costs (Department of Agriculture, 2025; PhilMech, 2025). By reducing dependence on expensive private service providers, cooperatives can reallocate financial resources to more productive investments, such as equipment maintenance, service expansion, and capacity-building initiatives. From a strategic perspective, the reduction in production costs strengthens the financial resilience of both farmers and cooperatives. Improved cost efficiency enables better budgeting, more effective resource allocation, and enhanced farm profitability. It also creates opportunities for cooperatives to achieve economies of scale, optimize service delivery, and improve overall member satisfaction. More importantly, the savings generated from mechanization provide a practical basis for reinvestment in productivity-enhancing activities, supporting the long-term sustainability of rice farming systems (Islam, 2020).

In conclusion, the consistently Very High ratings across all indicators affirm that the RCEF program delivers substantial financial benefits by reducing production costs. By lowering operational expenses and improving efficiency, the program not only enhances farm-level competitiveness but also strengthens cooperative financial management. These gains position mechanization as a key driver in building a more sustainable, efficient, and economically resilient rice production sector in Rizal.

The data presented in Table 5 reveal an overall mean of 3.72, interpreted as Very High, indicating that farmer-members strongly perceive the financial benefits of the Rice Competitiveness Enhancement Fund (RCEF) program in terms of income. This suggests that mechanization has meaningfully improved farm productivity and, in turn, enhanced household income among cooperative members. Beyond cost savings, the results indicate that farmers are beginning to experience more stable, potentially higher earnings due to more efficient, timely farm operations. Among the indicators, the highest rating was observed in the ability of cooperative mechanized services to help farmers save more and retain higher income (3.78). This highlights the role of cooperative-based service delivery in reducing operational expenses while maximizing returns. By lowering production costs and improving efficiency, farmers can retain a larger share of their earnings, thereby reinforcing the economic value of collective access to mechanization (Wu et al., 2025).

Table 5
Mean Level of Financial Impact in terms of Income

Income	Weighted Mean	Interpretation
1. My net income increases after mechanization reduced my labor costs.	3.77	Very High
2. The cooperative's mechanized service fees enable me to save more and retain a higher income.	3.78	Very High
3. The reduction in post-harvest losses contributes to higher income from my produce.	3.78	Very High
4. Using RCEF machinery has improved my income per hectare compared with previous seasons.	3.63	Very High
5. I benefit financially from the cooperative's earnings generated through machinery services.	3.68	Very High
6. Mechanization frees time that I can use for other income-generating activities.	3.69	Very High

7. The increase in my income allows me to reinvest in farm inputs and improvements.	3.64	Very High
8. Overall, mechanization has improved the profitability of my farming operations.	3.77	Very High
Composite Mean	3.72	Very High

Scale: 3.25-4.00 Very High; 2.50-3.24 High; 1.75-2.49 Moderate; 1.00-1.74 Low

On the other hand, the lowest-rated indicator, although still within the Very High category, is the improvement in income per hectare (3.63). This suggests that while farmers generally experience income gains, the extent of increase per unit area may vary depending on factors such as farm size, yield performance, and access to complementary inputs. Nevertheless, the consistently high ratings across all indicators indicate that the income-related benefits of mechanization are broadly felt among farmer-members. These findings are supported by empirical studies highlighting the economic advantages of agricultural mechanization. Arbes et al. (2024) found that the adoption of mechanized technologies under the RCEF program improves operational efficiency and reduces labor costs, ultimately increasing farm productivity and income. Similarly, Belton et al. (2021) emphasized that access to mechanization services through cooperatives enables smallholder farmers to lower production costs while improving efficiency and income opportunities. Diao et al. (2020) further explained that mechanization contributes to rural economic growth by enhancing labor productivity and allowing farmers to allocate time to other income-generating activities. Taken together, these findings reinforce the view that mechanization, particularly when delivered through cooperative systems, plays a critical role in improving farm profitability and strengthening farmers' financial resilience. It not only enhances productivity but also creates opportunities for more efficient use of resources and time, ultimately supporting more sustainable livelihood outcomes. In conclusion, the consistently Very High ratings across all income indicators demonstrate that the RCEF Mechanization Program delivers substantial financial gains at the farm level. By improving efficiency, reducing costs, and enabling better income retention, the program contributes to a more resilient and economically viable rice farming sector in Rizal.

The data presented in Table 6 reveal an overall mean of 3.74, interpreted as "Very High," indicating that farmer-members strongly recognize the financial and operational benefits of rice extension services under the Rice Competitiveness Enhancement Fund (RCEF) program. This suggests that extension services serve as a critical support mechanism, enhancing the effectiveness of mechanization by equipping farmers with the knowledge and skills needed to maximize its use. In practical terms, farmers are not only provided with machinery but are also guided on how to utilize these technologies efficiently, leading to better farm outcomes. Among the indicators, the highest rating was observed in the improvement of farmers' knowledge on rice production technologies through training programs (3.79). This highlights the central role of extension services in building technical competence, enabling farmers to better understand and apply improved farming practices. As farmers become more knowledgeable, they are better able to make informed decisions that directly influence productivity and income.

Table 6
Mean Level of Financial Impact in terms of Rice Extension Services

Rice Extension Services	Weighted Mean	Interpretation
1. Training programs under RCEF improve my knowledge of rice production technologies.	3.79	Very High
2. Capacity-building activities help me operate and maintain machinery properly.	3.79	Very High
3. I have access to learning sites that demonstrate updated farming practices.	3.77	Very High
4. Extension services support my adoption of good agricultural practices.	3.78	Very High
5. The recommendations from extension specialists improve my farm decision-making.	3.67	Very High
6. The training sessions help reduce machine downtime through proper maintenance.	3.61	Very High
7. I benefit from the instructional materials provided by Rice Extension Programs.	3.77	Very High
8. Overall, extension services strengthen my ability to manage mechanized rice farming.	3.77	Very High
Composite Mean	3.74	Very High

Scale: 3.25-4.00 Very High; 2.50-3.24 High; 1.75-2.49 Moderate; 1.00-1.74 Low

On the other hand, the lowest-rated indicator, although still within the Very High category, is the role of training in reducing machine downtime (3.61). While slightly lower, this still reflects a strong acknowledgment of the importance of training in maintaining operational efficiency. It may suggest that, while farmers recognize the value of training, challenges with machine maintenance and technical troubleshooting still require more targeted or ongoing support. Nonetheless, the consistently high ratings across all indicators indicate that extension services provide comprehensive and sustained benefits. These findings are supported by existing studies emphasizing the importance of structured agricultural extension programs. Arbes et al. (2024) found that hands-on training and field demonstrations significantly improve farmers' technical skills and decision-making capabilities, particularly when integrated with mechanization initiatives. Similarly, Kim et al. (2022) reported that cooperative-based extension services enhance operational efficiency and reduce machinery downtime, ultimately increasing farm income. These results affirm that extension services play a vital role in bridging the gap between technology provision and effective utilization.

Moreover, extension programs facilitate the adoption of good agricultural practices, strengthen farm-level decision-making, and promote the use of updated production technologies. Learning sites and demonstration farms provide farmers with opportunities to observe actual applications of mechanized operations, reinforcing both skill development and confidence. As noted in previous studies, when extension services are aligned with cooperative-managed mechanization, they contribute to reduced operational costs, improved efficiency, and enhanced farm profitability (Arbes et al., 2024; Kim et al., 2022). In summary, the consistently Very High ratings across all indicators confirm that rice extension services are a key driver of the RCEF program's benefits. By providing continuous technical guidance, practical training, and advisory support, these services enable farmers and cooperatives to fully utilize mechanization, improve farm management practices, and sustain productivity gains. Ultimately, extension services strengthen not only operational efficiency but also the long-term financial resilience and competitiveness of rice farming in Rizal.

The data presented in Table 7 reveal the structural relationships between the components of the Rice Competitiveness Enhancement Fund (RCEF) Mechanization Program and the financial outcomes of farmer members. The results indicate that mechanization has a statistically significant and positive influence on production costs, farmers' income, and rice extension activities. Specifically, mechanization shows a significant effect on production cost ($\beta = 0.278$, $p < .001$), farmers' income ($\beta = 1.000$, $p < .001$), and rice extension services ($\beta = 1.000$, $p < .001$), suggesting that it is the strongest predictor of financial performance within the model. These findings imply that access to machinery and mechanized services directly translates into tangible economic gains for farmers, particularly in terms of cost reduction and income improvement. The strong influence of mechanization stems from its ability to streamline farm operations, reduce labor dependence, and improve efficiency across the different stages of rice production. Mechanized activities such as land preparation, planting, harvesting, and post-harvest processing significantly lower labor costs and enhance operational productivity. Empirical evidence supports this, showing that mechanization reduces labor expenses by approximately ₱0.88 to ₱2.92 per kilogram of palay, equivalent to savings of ₱3,608 to ₱11,972 per hectare (PhilMech, 2025). In addition, improved post-harvest systems increase milling recovery rates, allowing farmers to generate higher output and income from the same level of production (Department of Agriculture, 2025). These outcomes reinforce the role of mechanization as a direct driver of financial improvement among farmer-beneficiaries.

Table 7
Path Coefficients and p-values for H₀

Path	Beta (β) Coefficient	p-value*	Interpretation
Ho: Extent of RCEF Program → Level of Financial Impact			
MECH → PRODCOST	0.278	<.001	Highly Significant
MECH → INCOME	1.000	<.001	Highly Significant
MECH → RICEXT	1.000	<.001	Highly Significant
CAPBLDG → PRODCOST	0.719	<.001	Highly Significant
CAPBLDG → INCOME	-0.000	.500	Not Significant
CAPBLDG → RICEXT	0.000	.500	Not Significant

*Significant at $p < .05$

In contrast, capacity-building interventions, while important, do not exhibit a direct significant effect on income and rice extension services in the structural model. This suggests that training programs, workshops, and technical assistance primarily function as enabling mechanisms rather than immediate sources of financial gain. Although they do not directly increase income, these interventions enhance farmers’ technical knowledge, decision-making skills, and ability to manage machinery effectively. As supported by previous findings, capacity-building initiatives improve farmers’ competence in operating and maintaining equipment, thereby indirectly contributing to better financial outcomes through more efficient use of mechanized technologies (PhilMech, 2025; Tran & Pham, 2021). These results align with earlier findings in the study, where mechanization consistently demonstrated strong positive effects on cost reduction and income generation. At the same time, capacity-building reinforced these benefits by improving operational efficiency. Studies have shown that training programs, including hands-on demonstrations and learning site visits, strengthen farmers’ ability to maximize the benefits of mechanization, even when the financial impact is not immediately observable (Cayetano et al., 2023; Kim et al., 2022). In this context, capacity-building serves as a critical support system that sustains and enhances the long-term effectiveness of mechanization.

Overall, the statistical evidence leads to the rejection of the null hypothesis, confirming a significant relationship between the RCEF Mechanization Program and the financial outcomes of farmer-members. While not all individual paths are directly significant, the structural model as a whole demonstrates that the program substantially influences production costs, income, and extension-related outcomes. The combined effect of mechanization, training, and cooperative-based service delivery creates a synergistic impact that strengthens both operational efficiency and financial resilience. In conclusion, the findings affirm that the RCEF Mechanization Program plays a vital role in improving the economic performance of rice farmers in Rizal. Mechanization emerges as the primary driver of financial gains, while capacity building enhances the effective use of these technologies. Together, these components contribute to reduced production costs, increased income, and more sustainable farming practices, positioning the program as a key instrument for agricultural modernization and long-term rural development.

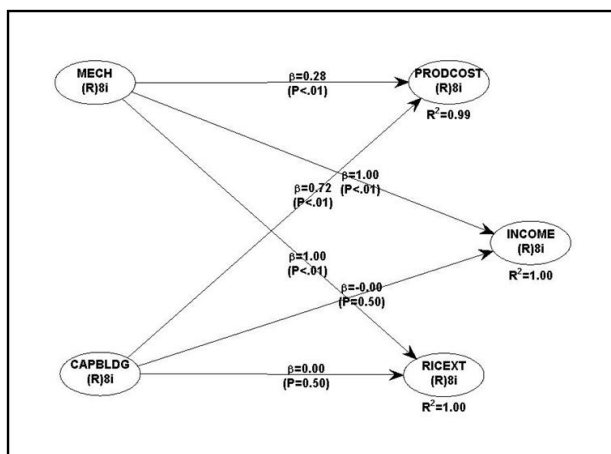


Figure 3. Structural Model of the Relationship Between Extent of RCEF Program and Level of Financial Impact on Respondents

Based on the structural model presented in Figure 3, the exogenous variables—Rice Competitiveness Enhancement Fund (RCEF) program components in terms of mechanization (MECH) and capacity building (CAPBLDG)—are directly linked to the endogenous variables representing financial impact, specifically production costs (PRODCOST), income, and rice extension services (RICEXT). The analysis of path coefficients indicates varying degrees of influence, with beta (β) values ranging from 0.00 to 1.00, suggesting that mechanization exerts a stronger and more direct effect on financial outcomes compared to capacity building, which tends to operate as a supporting mechanism. The coefficient of determination (R^2) values further demonstrate the model’s strong explanatory power, with 100% ($R^2 = 1.00$) of the variance in income and rice extension services

and 99% ($R^2 = 0.99$) of the variance in production costs explained by the model, indicating an exceptionally high level of predictive accuracy. While significance levels range from $p < .01$ to $p = .50$, implying that not all relationships are equally strong, the overall results confirm that the RCEF program components are comprehensive and sufficient in explaining the financial variations among farmer-respondents, underscoring the program’s substantial role in shaping cost efficiency, income generation, and extension-related outcomes.

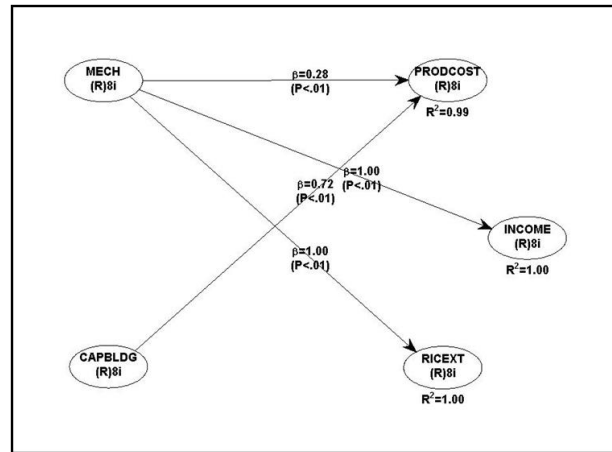


Figure 4. Emerging Model of the Relationship Between Extent of RCEF Program and Level of Financial Impact on Respondents

The emerging model displayed in Figure 4 isolates the statistically significant pathways that define the relationship between the RCEF program components and financial impact. The new model represents the refined framework where only verified relationships were retained. The four direct pathways reveal low to perfect positive beta coefficients from 0.28 to 1.00 which are duly supported by the significance level, $p < .01$. As regards predictive strength, the emerging model retains an extremely high explanatory power ($R^2=1.00$) for income and rice extension services and ($R^2=0.99$) for production cost, indicating that these variables almost perfectly account for the financial changes observed in the respondents.

Table 8
Standardized Estimates of the Path in the Emerging Model

Hypothesis	Standardized Estimates (β)	Standard Error	p -value*	Effect Coefficient**	Effect Size
Ho: Extent of RCEF Program→Level of Financial Impact					
MECH→PRODCOST	0.278	0.061	<0.001	.274	Medium
MECH→INCOME	1.000	0.054	<0.001	1.000	Large
MECH→RICEXT	1.000	0.054	<0.001	1.000	Large
CAPBLDG→PRODCOST	0.719	0.057	<0.001	.714	Large

*Significant at $p < 0.05$

**Effect size coefficient: 0.02 – small, 0.15 – medium, 0.30 – large

The results presented in Table 8 show the standardized estimates of the emerging structural model, indicating refined relationships between the Rice Competitiveness Enhancement Fund (RCEF) program components and financial outcomes. The standard errors, ranging from .054 to .061, suggest precise and reliable estimates. At the same time, non-significant paths—specifically, from capacity building to income and to rice extension services ($\beta = 0.000$, $p = .500$)—were removed to improve model fit. The findings reveal that mechanization is the strongest predictor of farmers’ financial status, with a perfect beta coefficient ($\beta = 1.000$), indicating a direct and substantial contribution to increased income and enhanced extension service outcomes. In contrast, its positive but lower effect on production costs ($\beta = 0.278$) reflects manageable increases associated with machinery use.

In contrast, capacity building has a significant influence, primarily on production costs ($\beta = 0.719$), suggesting that training and technical support encourage the adoption of more advanced, input-intensive farming practices that may initially raise costs but support long-term productivity gains. These results are consistent with earlier findings showing that mechanization reduces labor costs, improves efficiency, and increases profitability, with

savings estimated at ₱0.88 to ₱2.92 per kilogram of palay, while also enhancing post-harvest outcomes such as milling recovery rates (Rahman & Salim, 2020; Kumar et al., 2019; Arbes et al., 2024; Kim et al., 2022). At the same time, capacity-building initiatives strengthen farmers' technical knowledge and decision-making, enabling more effective use of mechanized technologies and encouraging investments in improved inputs. Overall, the findings support rejecting the null hypothesis and confirm that the RCEF program significantly influences financial outcomes, with mechanization serving as the primary driver of income and efficiency and capacity building shaping the evolving cost structure of modern rice farming systems.

Table 9
Sustainability Plan for the RCEF Program

Sustainability Program	Description	Expected Outcome	Timeframe	Responsible Implementers
1. Cooperative-Based Machinery Management System	Establish a structured machinery management framework, including scheduling, monitoring, and maintenance protocols with designated operators.	Improved machinery utilization, reduced downtime, and extended lifespan	Year 1–5 (continuous)	Cooperative Officers, Machine Operators, MAO
2. Machinery Maintenance and Replacement Fund	Create a dedicated fund from service fees for preventive maintenance, spare parts, and equipment upgrading.	Sustainable financing and reduced risk of obsolescence	Year 1–5 (continuous)	Cooperative Treasurer, Chairperson
3. Continuous Capacity-Building Program	Institutionalize regular training on mechanized farming, maintenance, and agribusiness management.	Enhanced technical competence and productivity	Quarterly (Year 1–5)	AEWs, MAO, PhilMech
4. Mechanization Service Enterprise Development	Operate machinery services as income-generating enterprises for members and nearby farmers.	Increased cooperative income and service access	Year 1–5 (scaling phase)	Cooperative Officers
5. Integrated Rice Productivity Enhancement Program	Combine mechanization with improved seeds, nutrients, and water management practices.	Higher productivity and farm income	Cropping seasons (Year 1–5)	AEWs, Farmers, MAO
6. Digital Monitoring and Farm Data System	Implement digital tracking of machinery use, production, and maintenance schedules.	Data-driven decision-making and transparency	Year 1–3 (establishment), Years 4–5 (optimization)	MAO, IT Support, Cooperative
7. Credit Access and Financing Support	Facilitate access to agricultural loans and cooperative financing schemes.	Increased investment capacity and profitability	Year 1–5 (ongoing)	MAO, Financial Institutions, Cooperative
8. Multi-Stakeholder Collaboration Program	Strengthen partnerships among LGUs, DA agencies, cooperatives, and farmer groups.	Sustained institutional support and coordination	Year 1–5 (continuous)	MAO, DA, PhilMech, Cooperatives

The sustainability of the RCEF Mechanization Program is anchored on economic, technical, and institutional strategies that ensure long-term operational efficiency and financial viability for farmer cooperatives. Economically, cooperatives are trained to operate mechanization services as income-generating enterprises, collecting service fees that are reinvested in maintenance, operations, and capacity building (Liao et al., 2022). Technical sustainability is reinforced through continuous training programs, strategic allocation of mechanization resources, and targets to increase mechanization intensity per hectare, ensuring that farmers maintain proficiency in equipment operation and maximize farm productivity (Tran & Pham, 2021; Gupta et al., 2023). Institutional strategies include cooperative-based machinery management, coordinated scheduling, and multi-stakeholder collaboration with local government units, national agencies, and extension services. Market-oriented approaches and international collaborations further enhance sustainability by promoting mechanization services, repair operations, and off-season utilization, ensuring both business viability and operational resilience (Tran & Pham,

2021). The proposed sustainability programs were derived from the analysis of survey results (Tables 2–7), particularly the consistently “Very High” ratings across financial, operational, and capacity-building indicators. These were further supported by key informant insights, existing RCEF implementation guidelines, and best practices in cooperative-based mechanization models. The integration of empirical findings and literature-based frameworks ensured that the proposed interventions are both evidence-based and context-responsive. The proposed budget follows a proportional allocation scheme, wherein 40% is allocated to machinery maintenance and spare parts, 30% to capacity-building and training, 20% to cooperative-led mechanization enterprises, and 10% to monitoring and evaluation. The actual monetary value of each component will depend on the total funding available to the cooperative or program, which may be sourced from service fees, government support, and external financing (Jayeola et al., 2022).

The primary implementers of the sustainability plan include the cooperative chairpersons and officers, who are responsible for enterprise management, machinery operations, and fund administration. Agricultural Extension Workers (AEWs) and technical specialists play a critical role in delivering training programs, providing technical support, and monitoring farm-level adoption of mechanization technologies. Meanwhile, the Municipal Agriculture Office (MAO) serves as the coordinating body, ensuring policy alignment, overseeing monitoring and evaluation, and facilitating linkages with national agencies such as the Department of Agriculture and the Philippine Center for Postharvest Development and Mechanization to support program implementation and sustainability. In summary, the integrated sustainability framework—combining economic incentives, continuous technical support, institutional coordination, and collaborative partnerships—ensures that mechanization services remain financially viable, technically proficient, and resilient. This approach supports the long-term modernization and competitiveness of the rice sector by enabling cooperatives to efficiently manage mechanization assets, sustain income-generating operations, and continuously improve technical capacity (Cayetano et al., 2023).

4. Conclusions

Based on the summary of findings presented, the following conclusion was drawn: The implementation of the Rice Competitiveness Enhancement Fund (RCEF) Program in the Municipality of Rizal, Occidental Mindoro, generates substantial benefits for rice farmers, particularly by improving access to mechanization services and enhancing technical capacity. These benefits are primarily anchored on the program’s integrated approach, which combines mechanization, capacity-building interventions, and cooperative-based service delivery. Mechanization provides the necessary operational support by reducing labor intensity, improving efficiency, and enabling timely farm operations. At the same time, training and technical assistance strengthen farmers’ knowledge, skills, and confidence in adopting modern farming practices. At the same time, cooperative management systems facilitate shared access to resources, promote coordination, and improve the overall delivery of mechanized services.

In terms of financial impact, the RCEF Program significantly reduces production costs and enhances cost efficiency among farmer-members. The use of cooperatively managed machinery allows farmers to access mechanized services at lower costs than private providers, resulting in reduced operational expenses and improved income retention. Furthermore, extension services play a vital role in reinforcing these gains by promoting the adoption of improved agricultural practices and updated production technologies, thereby increasing productivity, improving yield quality, and raising revenue.

These outcomes demonstrate that the program not only improves farm operations but also strengthens the financial viability of rice farming at both the individual and cooperative levels. However, the findings indicate that, while the overall extent of RCEF program implementation does not exhibit a significant direct relationship with overall financial impact, a more detailed analysis reveals that mechanization is the primary driver of financial outcomes. It consistently leads to reductions in production costs, improvements in income, and greater access to rice extension services. In contrast, capacity-building interventions, although significant, primarily affect the cost structure of farming operations by encouraging the adoption of improved but potentially more resource-intensive practices. This suggests that capacity building functions as a complementary mechanism that enhances the

effective utilization of mechanization rather than directly generating financial gains. Overall, the results highlight that the strength of the RCEF Program lies in the synergy between its components. Mechanization delivers immediate and tangible economic benefits, while capacity-building ensures that these gains are sustained through improved knowledge, technical skills, and farm management practices. The integration of these elements creates a balanced framework that supports both short-term productivity and long-term agricultural sustainability. To ensure the continued effectiveness of the program, the integration of digital monitoring systems, improved access to agricultural credit, adoption of productivity-enhancing technologies, and strengthened collaboration among stakeholders are essential. These strategies will support better program tracking, facilitate investment in mechanization, and enhance coordination among farmers, cooperatives, and implementing agencies. Ultimately, sustaining and scaling these interventions will reinforce the competitiveness, resilience, and long-term growth of the rice sector in Rizal and Occidental Mindoro.

Recommendations - In view of the findings and conclusions presented, the following recommendations are proposed to enhance the effectiveness of the Rice Competitiveness Enhancement Fund (RCEF) Mechanization Program and its financial impact on farmers in Rizal and Occidental Mindoro. Farmer cooperatives may take a more active role in program planning, particularly in machinery allocation, scheduling, and service delivery, to ensure that mechanization interventions are aligned with actual farm-level needs. Strengthening cooperative-based management systems, including clear protocols for utilization and maintenance, may improve the efficiency and sustainability of mechanized services. To reinforce the gains from mechanization, continuous, structured capacity-building programs may be institutionalized. Agricultural Extension Workers (AEWs) and technical personnel may provide regular hands-on training, technical assistance, and monitoring to strengthen farmers' competencies in operating and maintaining machinery and managing farms. Training programs may also be made more outcome-oriented, focusing on improving productivity, cost efficiency, and income generation, ensuring that knowledge gained translates into measurable financial benefits. Access to affordable agricultural financing may be expanded through stronger linkages with financial institutions and government support programs. Cooperatives may be encouraged to develop mechanization-based service enterprises as additional income streams. In contrast, extension services may integrate financial literacy and resource management training to enhance farmers' decision-making and optimize resource use. These efforts may improve cost efficiency, increase productivity, and strengthen income stability among farmer-members.

The Municipal Agriculture Office (MAO) may take the lead in strengthening coordination, policy alignment, and program monitoring, including collaboration with national agencies such as the Department of Agriculture and the Philippine Center for Postharvest Development and Mechanization. The integration of digital monitoring systems for machinery usage, service delivery, and farm productivity may be adopted to improve transparency, tracking, and evaluation of program outcomes. Multi-stakeholder collaboration among cooperatives, government agencies, extension services, and local institutions can be further strengthened to ensure more cohesive and responsive program implementation. By aligning technical support, financing, and institutional efforts, the program may sustain its impact and enhance the competitiveness of the rice sector. Finally, future researchers may conduct longitudinal and comparative studies to assess the long-term impacts of the RCEF Mechanization Program across different localities. Further research may also explore areas such as technology adoption behavior, cooperative governance, and climate resilience to provide a more comprehensive understanding of the program's broader development outcomes. These recommendations, when effectively implemented, may help sustain the financial viability, operational efficiency, and long-term resilience of rice farming in Rizal and Occidental Mindoro.

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A feasibility study on the establishment of a driving license review center in Occidental Mindoro

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Abstract

The increasing number of driver's license applicants in Occidental Mindoro particularly among tricycle and motorcycle drivers, has revealed gaps in knowledge of traffic laws and road safety, resulting in high failure rates in the Land Transportation Office (LTO) theoretical examinations. In line with the LTO Road Safety Education Program, establishing a Driving License Review Center aims to provide structured learning to improve applicants' understanding of traffic rules, enhance examination performance, and promote safer, more responsible driving within the community. The growing number of license applicants indicates a stable demand for review services, particularly among drivers who struggle with theoretical examinations. By offering localized, simplified instruction tailored to applicants with varying educational backgrounds, the center can improve comprehension through guided discussions and simulated examinations. The center may also expand its offerings to include refresher courses for license renewals, specialized reviews for professional drivers, and seminars on updated traffic regulations and responsible driving. The study found strong market demand: 95% of respondents expressed interest in enrolling, and many applicants took the driver's license examination multiple times, indicating a need for structured review services. The absence of a similar facility in the area presents minimal competition, while the target market, primarily students, young adults, and transport workers, ensures consistent demand. With effective marketing strategies, qualified instructors, an accessible location, and affordable pricing, the proposed review center is considered feasible and capable of generating a stable income. The study therefore recommends implementing strategic promotion, improving instructional and mock-examination programs, hiring competent instructors, monitoring financial performance, and exploring future expansion into nearby municipalities.

Keywords: driver education, review center, responsible driving, road safety awareness, Land Transportation Office (LTO)

A feasibility study on the establishment of a driving license review center in Occidental Mindoro

1. Introduction

The increasing number of driver's license applicants in Occidental Mindoro, particularly among tricycle and motorcycle drivers, has highlighted persistent challenges related to driver preparedness and road safety awareness. While many applicants possess practical driving experience gained through daily work and livelihood activities, a significant number demonstrate limited formal knowledge of traffic laws, road signs, and safe driving principles (Partulan et al., 2024). This gap between practical experience and theoretical understanding has contributed to a high failure rate in the theoretical driving examinations required for driver's license issuance. Based on available records, approximately half of the total applicants fail the theoretical examination, indicating a substantial deficiency in applicants' preparedness and understanding of essential driving concepts.

Under Republic Act No. 4136, also known as the Land Transportation and Traffic Code, all individuals applying for a driver's license are required to demonstrate adequate knowledge of traffic laws, rules of the road, and safe driving practices. The law emphasizes that driving is a regulated privilege rather than a right, and that compliance with traffic regulations is necessary to maintain road order and ensure public safety. In support of this, Republic Act No. 10930 strengthens the licensing system by requiring more stringent, competency-based examinations to ensure that only qualified and knowledgeable individuals are granted licenses. Despite these legal requirements, many driver's license applicants in San Jose, Occidental Mindoro, lack access to formal, structured review mechanisms that could adequately prepare them for the theoretical driving examination. The existing examination system allows applicants to retake the test multiple times; however, this setup may encourage repeated attempts and memorization rather than genuine understanding of traffic laws and responsible driving behavior.

As a result, applicants may pass the examination without fully internalizing road safety principles and legal responsibilities. Knowledge of traffic rules and regulations is essential for promoting orderly traffic flow, reducing road conflicts, and protecting all road users, including pedestrians and passengers. Drivers with insufficient understanding of traffic laws may unintentionally commit violations, misinterpret road signs, or engage in unsafe practices such as improper overtaking, failure to yield, or disregard for traffic control devices (Al Zahra & Brilianti, 2025). These behaviors increase the risk of road accidents, traffic congestion, and enforcement challenges within the municipality. This concern is particularly significant among tricycle and motorcycle drivers, who constitute a large proportion of road users in Occidental Mindoro. Due to limited vehicle protection and frequent exposure to mixed traffic conditions, these drivers are among the most vulnerable to road hazards. Enhancing their knowledge of traffic laws, defensive driving techniques, and legal accountability is essential to promoting safer driving behavior and minimizing the risk of accidents.

The proposed establishment of a Driving License Review Center in San Jose, Occidental Mindoro, aims to address these challenges by providing a localized, structured learning environment for driver's license applicants. The review center will offer guided review sessions, simplified explanations of traffic laws and road signs, practice theoretical examinations, and values-oriented discussions on responsible driving. By emphasizing meaningful learning rather than rote memorization, the center aims to improve examination performance, reduce repeated failures, and contribute to the development of informed, disciplined, and safety-conscious drivers. In view of the high failure rate among examinees, the lack of accessible review facilities, and the legal requirements governing driver licensing, establishing a Driving License Review Center in San Jose, Occidental Mindoro, is considered both necessary and feasible. The proposed project aims to strengthen driver competence, enhance compliance with traffic laws, and promote safer road use within the community.

Objectives of the Study - The main objective of this study is to determine the feasibility and viability of

establishing a Driving License Review Center in Occidental Mindoro that will provide structured and systematic review services to driver's license applicants, particularly tricycle and motorcycle drivers, to enhance their knowledge of traffic laws, road signs, and safe driving practices. The specific objectives of this study are as follows: (1) To identify the target market and formulate appropriate marketing strategies and promotional techniques. (2) To determine the technical requirements in terms of facilities, equipment, instructional materials, and review methodologies. (3) To determine an appropriate organizational structure and management system. (4) To assess the socio-economic benefits of the proposed project. (5) To determine the total capital investment required and prepare projected financial statements to evaluate its financial feasibility and profitability.

Significance of the Study - The establishment of a Driving License Review Center in Occidental Mindoro will benefit applicants, the owner/proponent, instructors/workers, the local government, and the community at large. The proposed review center will help applicants, particularly tricycle and motorcycle drivers, improve their understanding of traffic laws, road signs, and safe driving practices. By offering structured review sessions, practice examinations, and guidance on responsible driving, applicants are expected to increase their chances of passing the theoretical driving examination and reduce the likelihood of repeated failures. Aside from generating income, the project will provide the proponent with an opportunity to apply knowledge in business management, education, and community service. It provides a practical platform to develop managerial and organizational skills while contributing positively to road safety in the municipality. The review center will offer employment opportunities to qualified instructors and staff. It also serves as a venue for professional growth, allowing workers to enhance their teaching abilities, knowledge of traffic laws, and customer service skills. The review center indirectly supports the municipality's traffic management efforts by producing better-prepared drivers. Increased driver awareness of traffic regulations may reduce traffic violations, accidents, and congestion, contributing to safer road conditions. The project will provide full-time employment to qualified local individuals and promote road safety awareness among drivers. In the long term, the center fosters a culture of responsible driving and contributes to public welfare by reducing accident risk and improving traffic discipline.

Scope and Delimitation of the Study - This study focused on determining the feasibility and viability of establishing a Driving License Review Center in Occidental Mindoro, with particular emphasis on preparing driver's license applicants for the theoretical examination. The primary objective of the study was to assess whether the proposed review center could effectively address the high failure rate among applicants, improve their knowledge of traffic laws and road signs, and enhance the overall preparedness of prospective drivers. Demand estimation and market analysis were conducted through a structured survey questionnaire distributed to a random sampling of tricycle and motorcycle drivers, as well as other potential driver's license applicants residing within San Jose. The survey period spanned from February 9, 2026, to February 20, 2026, to ensure a representative snapshot of the current applicant population and their study needs. The proposed review center will be established in a strategic and accessible location within the municipality, ensuring convenience for applicants from various barangays. Survey findings indicated that a significant portion of applicants—approximately half—have failed the theoretical examination at least once, underscoring the need for a structured, systematic review program. Consequently, the study targeted this population as the primary market, focusing on drivers who require additional support and structured learning to pass the theoretical exam successfully.

This feasibility study was limited to the theoretical aspect of driver licensing preparation. It did not include practical driving lessons, hands-on vehicle operation training, or official licensing procedures conducted by the Land Transportation Office (LTO). Additionally, the study relied on survey responses and secondary data, which could be influenced by respondents' perceptions, willingness to participate, and the accuracy of self-reported experiences regarding previous examination attempts. Other limitations included potential external factors that could affect the review center's operations and feasibility. These included changes in licensing policies, modifications in examination formats, variations in traffic regulations, and the availability of qualified instructors. Such factors would require periodic adjustments in curriculum design, teaching strategies, and operational planning to maintain the center's effectiveness and relevance. Despite these limitations, the study provided a comprehensive analysis of the local demand, market potential, and operational requirements necessary to establish

a feasible and sustainable Driving License Review Center in Occidental Mindoro.

The study also included a comprehensive analysis of market demand, identifying the target market and developing proposed marketing strategies and promotional approaches suited to the local context. It further examined the technical requirements for reestablishing the provision, including facilities, equipment acquisition, preparation of instructional materials, and the selection of effective new methodologies. In addition, the study presented a proposed organizational structure and management system to guide the center's operations. Its center's operational socio-economic contributions to the project, particularly in improving applicants' knowledge, increasing passing rates, promoting road safety, and generating potential employment opportunities within the locality. Moreover, the financial feasibility of the proposed review center was assessed by preparing estimates and project plans to determine its potential profitability and sustainability. However, the study was limited to planning and evaluation and did not include the actual implementation, day-to-day operation, or real-time financial performance of the proposed review center.

Sources of data - The researcher utilized both primary and secondary sources, which were essential to the success of this feasibility study. For primary data, a survey was conducted among a randomly selected group of students at DWCSJ and OMSC; self-employed individuals; employed individuals; potential driver's license applicants, particularly tricycle and motorcycle drivers; as well as other individuals seeking to apply for or renew licenses in San Jose, Occidental Mindoro, to collect information on how the target market would patronize this service and the amount they were willing to pay. The survey aimed to identify applicants' awareness and preparedness for the theoretical examination, measure interest and willingness to enroll in a structured review center and understand perceived challenges in passing the theoretical examination. The survey was completed within 15 days, providing timely and relevant data on applicants' needs and behaviors in San Jose. Secondary data was obtained from credible institutions, including the Land Transportation Office (LTO) – San Jose, Occidental Mindoro. Data included historical counts of driver's license applicants (student permit, non-professional, and professional licenses), theoretical examination topics and coverage, examination performance (pass rates and trends), and transaction volumes. Philippine Statistics Authority (PSA) Population statistics, including age groups eligible for driver's licenses, were used to estimate the potential market size for review services. Local Government Unit (LGU) – San Jose, Occidental Mindoro Reports on road safety, transportation trends, and motor vehicle registrations provided additional context for demand estimation. Information from research studies and existing feasibility analyses was used to understand best practices, operational standards, and review center structures. By combining secondary data with survey responses, the study ensured comprehensive coverage and direct insight from potential clients. LTO records provided complete population-level information, including applicant volumes, pass rates, and examination performance trends, allowing for accurate demand estimation, technical planning, and financial projections. The survey captured the perspectives, attitudes, and needs of applicants, validating and supplementing official records.

Ethical Considerations - The researchers ensured that all information gathered in this feasibility study was used solely for academic and research purposes and that it complied with the provisions of the Data Privacy Act of 2012 (Republic Act No. 10173). Before data collection, the researchers formally requested permission from the respondents, particularly prospective driver's license applicants, tricycle and motorcycle drivers, and other relevant participants in San Jose, Occidental Mindoro. The respondents were clearly informed about the purpose of the study and the feasibility of establishing a Driving License Review Center to support road safety and improve preparedness for the practical driving examination. The researchers assured the respondents that all personal information, responses, and documents collected during the study would be treated with strict confidentiality. These data were used only for the analysis and interpretation of results related to the objectives of the research and were not disclosed to any unauthorized individual or organization. Participation in the study was voluntary, and respondents were given the right to withdraw at any time or decline to answer any question without any negative consequences. Furthermore, the researcher ensured that the study upheld academic integrity by properly acknowledging all sources of information related to traffic laws, road education, and existing literature. No information was plagiarized, and all references were cited using the APA 7th Edition citation style in recognition

of the intellectual property rights of the original authors. Through these measures, the researchers maintained ethical responsibility toward participants and integrity in conducting the feasibility study to establish a Driving LTO center in San Jose, Occidental Mindoro.

2. Methodology

This feasibility study employed a descriptive research design using a survey questionnaire to evaluate the viability of establishing a Driving License Review Center in Occidental Mindoro. The study focused on assessing market demand, technical requirements, financial feasibility, socio-economic impact, and potential risks. To achieve a comprehensive analysis, the research utilized secondary data from official records and primary data collected through surveys of potential clients. Among the 1,383 recorded population size, 50% of the population (691) were from those who enrolled in the three (3) driving schools, the 15% (207) of the population made self-reviewer, while the 5% of the population (70) enrolled in online classes, thus from the 30% (415) unattended needs of the driver's license applicant, the sample size was 200. It was computed using the Raosoft calculator with a 5% margin of error and a 95% confidence level. The respondents of this study were randomly selected from the group of students of DWCSJ and OMSC, self-employed, employed, and potential driver's license applicants, particularly tricycle and motorcycle drivers, as well as other individuals seeking to apply for or renew licenses coming from different municipalities in Occidental Mindoro.

2.1 Market Study

Market Description - The proposed Driver's License Review Center will operate in the Municipality of San Jose, a first-class municipality and the commercial hub of Occidental Mindoro. As the province's center of trade, education, and transportation, San Jose has a population of students, workers, and transport drivers who require driver's licenses for mobility and employment. The increase in individuals applying for student permits, non-professional, and professional licenses creates a viable market for review services. To obtain the necessary primary data for this feasibility study, the researcher conducted two (2) separate market surveys to evaluate relevant aspects of the proposed Driver's License Review Center. These surveys were designed to evaluate market potential, customer interest, pricing acceptability, preferred service format, and the presence of existing service providers within the locality. To measure market demand, a structured questionnaire was administered to a representative sample of prospective driver's license applicants in San Jose. The respondents included individuals without licenses, student permit holders, professional and non-professional applicants, and those upgrading or renewing licenses. This demand-side assessment aimed to determine the level of interest in enrolling in a review center, the frequency of examination attempts, preferred topics and formats, and willingness to pay for review services.

On the supply side, a separate industry scan and survey were conducted to identify existing review providers, driving schools, and informal sources of review services. This supply analysis aimed to assess the availability, scope, pricing structure, and service capacity of current providers. The findings were used to assess market competition and identify service gaps that the proposed Driver's License Review Center intends to address. During the initial phase of operations, the proposed Driver's License Review Center will primarily serve prospective driver's license applicants in Occidental Mindoro. As the commercial and educational hub of Occidental Mindoro, San Jose presents a concentrated market of students, transport workers, and first-time license applicants, making it a strategic location for market entry. Upon achieving operational stability and sufficient enrollment capacity, the business intends to expand its market coverage to neighboring municipalities within the province. Expansion will be based on demonstrated market demand, financial performance, and institutional capability to deliver quality review services. This phase of market development strategy ensures controlled growth while maximizing service reach and long-term sustainability of the proposed project.

Demand Analysis - San Jose is the most progressive town in Occidental Mindoro and has the largest number of vehicles, such as cars, trucks, and tricycles (Kupikomkon, n.d.). To drive an automated vehicle, the driver needs to secure a driver's license from the LTO. Unfortunately, many applicants fail the driver's license examination due

to a lack of reexamination; per the requirement, more than half of the respondents failed on their first attempt. There is therefore a need for them to review and take the exam to secure their driver's license. Another source of market demand is senior high school students who will soon attain the age of majority and will surely apply for a driver's license. The families of these students are usually drivers, and they would drive these vehicles. It is worthwhile for girls today to apply for a driver's license.

Table 1
Population of the Respondents (n=200)

Applicants	Population (N)	Sample Size (n)
Students	240	116
Self-Employed	50	24
Employed	17	8
Potential driver's license applicants, particularly tricycle and motorcycle drivers	108	52
Total	415	200

Table 1 presents the population and the corresponding sample sizes of the respondents for the driving license review center. The proponent chose these specific groups because they represent the most active road users in our community. Students are our new market, while the employed and Self-Employed need licenses to maintain their livelihoods. Most importantly, we are targeting Motorcycle and Tricycle drivers because they constitute the largest share of riders in our province. By focusing on these groups, we ensure that our business has a consistent flow of customers who see a license not just as a card, but as a necessity for their daily lives. The target market is categorized into four groups: Students, Self-Employed individuals, Employed professionals, and Potential drivers (specifically those operating tricycles and motorcycles). The largest group of respondents is students, representing 58% of the total sample (n = 116), followed by potential tricycle and motorcycle drivers, who make up 26% (n = 52). The population distribution, based on the target demographics in Occidental Mindoro, is most likely to require license review services. To ensure the statistical reliability of the data, the researcher used a sample of 200 from a population of 415. Similar to established research standards, the sample size was determined to maintain a five percent (5%) margin of error and a ninety-five percent (95%) confidence level using Raosoft Computation. The researcher used stratified random sampling to ensure that each applicant category—from students to professional drivers—was proportionately represented in the study. This approach allows the feasibility study to capture the specific needs and willingness to pay across different socio-economic brackets in the province. Additionally, the study considers the logistical accessibility of these respondents, focusing on those within the immediate catchment area of the proposed center to ensure accurate market demand forecasting (Hasan, 2024).

Table 2
Number of times taken the Driver's License Exam

Number of Times	Frequency	Percent
First	46	23.00
Second	26	13.00
Third	17	8.50
Fourth and more	111	55.50
TOTAL	200	100.0

Based on the survey results, a significant number of people struggle with the LTO exam. Specifically, 55.50% (111 respondents) reported taking the examination 4 or more times. This indicates that more than half of the respondents required multiple attempts before passing or are still in the process of obtaining their license. Meanwhile, 46 respondents, or 23.00%, took the exam (for the first time), representing nearly one-fourth of the sample. The second attempt was reported by 26 respondents (13.00%), while 17 respondents (8.50%) took the exam for the third time. The data clearly show a decreasing frequency from first to third attempts, followed by a sharp increase in the "fourth and more" category. Overall, the findings suggest that many respondents encounter challenges passing the Driver's License Examination on their first attempt. The high number of first-time exam takers who took the exam four or more times may indicate difficulties with exam preparation, understanding of traffic rules, or test anxiety. It may also reflect stricter examination standards or limited access to adequate review materials (Yusefzadeh et al., 2019). On the other hand, the 2.00% who passed or attempted the exam on their first

try indicate that a portion of the population is well prepared. These results highlight the need for improved driver education programs and more effective review support to increase first-time passing rates.

Table 3
Respondents' Interest in Driver's License Review Center

Respondents Interest	Frequency	Percent
Very Interested	134	67.00
Interested	56	28.00
Not Interested	10	5.00
TOTAL	200	100.0

The data on respondents' interest in a Driver's License Review Center show that the majority are very interested, with 134 respondents (67.00%) expressing strong interest. This indicates that more than two-thirds of the population highly favor the establishment or availability of a review center. Additionally, 56 respondents (28.00%) reported being interested, following the overall positive response. Only 10 respondents, or 5, rated.00%, indicating that they are not interested. The results clearly demonstrate a strong demand for review services among the respondents. Overall, the findings suggest significant interest and a perceived need for a Driver's License Review Center. The combined 95.00% of respondents who are either very interested or interested highlights the potential viability and sustainability of such a service. This strong interest may be linked to the challenges many respondents face in passing the driver's license examination. The small percentage of those not interested indicates minimal opposition or a lack of demand (Lumec, 2020a). Therefore, the data support the idea that establishing a review center could effectively address the needs of the majority of respondents' *License Status*

Status	Frequency	Percent
No License	101	50.50
Student Permit (For Sub-Professional Application)	55	27.50
For Professional Application	26	13.00
For Upgrading (Magdagdag ng Restriction)	13	6.50
Expired for Renewal (Paso at for Renewal)	5	2.50
TOTAL	200	100.0

The data on Driver's License Status reveal that the majority of respondents do not yet possess a driver's license, with 101 individuals or 50.50% classified under (Licen)se." This indicates that more than half of the respondents are either new applicants or have not yet begun the licensing process. Meanwhile, 55 respondents, or 27.50%, hold a student permit for sub-professional applications, suggesting that a significant portion is in the initial stage of acquiring a license. Additionally, 26 respondents (13.00%) are applying for a professional license. Smaller proportions include 13 respondents (6.50%) who are upgrading or adding restrictions to their licenses, and 5 respondents whose licenses have expired and are due for renewal. Overall, the findings show that a large segment of the population is still in the process of obtaining or regularizing their driver's license. The high percentage of individuals without a license may indicate limited access to licensing services, financial constraints, or insufficient preparation for the examination (Dong et al., 2023). The notable number of student permit holders reflects an active interest in progressing toward full licensure. Meanwhile, the smaller percentages of professional applicants, upgrading applicants, and renewal cases suggest that fewer respondents are already established licensed drivers. These results emphasize the need for continued support, education, and accessible services to assist individuals in completing the licensing process.

To identify the proposed business opportunity, the proponent reviewed the total number of examined applicants (1,383; Table 1) and determined how many were existing options. The proponent found that 50% attend traditional driving classes, 15% study on their own, and 15% use online classes. This brings the total to 70% of the market already 'accounted for.' The remaining 30% (or 415 people) are considered 'Unattended.' These are individuals who have not enrolled anywhere or found a formal way to prepare for their exams. This 30% gap is the primary reason our Review Center is needed. Given the 30% unattended nature of the drinking applicant, the researcher decided to take only a conservative amount of 200 monthly for the proposed repayment period. The total population was 1,383, with the following breakdown: 691 enrolled in schools, 207 conducted self-reviews, and 70 enrolled in online classes.

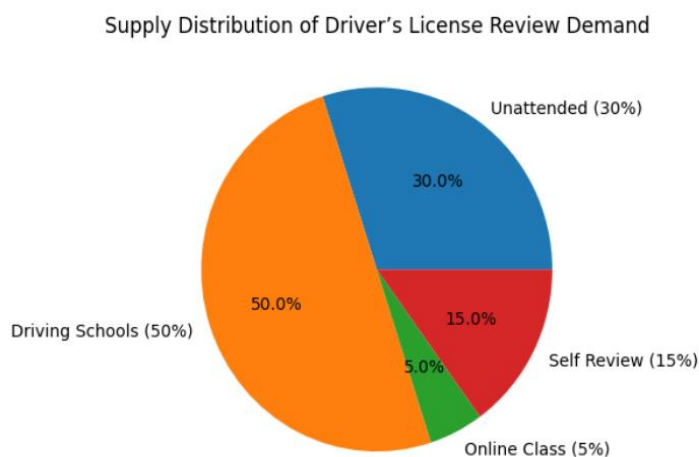


Figure 1. Supply Distribution of Driver's License Review Demand

Demand-Supply Analysis - The market in Occidental Mindoro demonstrates strong demand for a Driving License Review Center. The target population is predominantly young, ranging from senior high to college level, including tricycle and motorcycle drivers, highlighting a capable and motivated market. On the supply side, four existing driving schools offer review services but focus mainly on general theoretical and practical courses, with applicants required only to attend these courses. Applicants receive practical lessons if they cannot drive, which means there is no specialized review center to address repeated exam failures. This mismatch between high demand and limited specialized supply creates a clear market, indicating that a structured Driving License Review Center with affordable pricing, strategic location, qualified instructors, and focused review sessions is both feasible and viable.

The demand and supply conditions for the proposed Driver's License Review Center are strongly influenced by the current licensing situation of applicants in the area. Survey results show that 55.50% of respondents have taken the Driver's License Examination 4 or more times, indicating significant difficulty passing the test. Additionally, 50.50% of respondents do not yet possess a driver's license, while 27.50% are student permit holders preparing for full licensure. These figures demonstrate a large pool of individuals who are either struggling to pass the examination or are still in the process of completing licensing requirements. Furthermore, 95% of respondents expressed interest in enrolling in a Driver's License Review Center, indicating strong market acceptance and a perceived need for structured review services. The repeated examination attempts and the high percentage of unlicensed or in-process applicants suggest gaps in current preparation methods (Dong et al., 2023; Crundall & Van Loon, 2025). On the supply side, the absence of a dedicated, registered review center in the locality indicates limited formal support for written-examination preparation. This imbalance between strong demand and minimal structured supply supports the feasibility of establishing a Driver's License Review Center in Occidental Mindoro.

Table 5
Demand and Supply Analysis of the Driving License Review Center

Year	Projected Demand	Projected Supply	Demand and Supply Gap	Unsatisfied Demand	Market Share
2027	1,521	3	1,518	30%	10%
2028	1,673	4	1,669	30%	10%
2029	1,840	5	1,835	30%	10%
2030	2,024	6	2,018	30%	10%
2031	2,226	7	2,219	30%	10%

Table 5 presents the detailed demand and supply analysis for the proposed Driving License Review Center. The data compares the projected number of license applicants requiring structured instruction (Demand) against the number of existing, legally accredited driving schools available in the market (Supply). The resulting large,

widening gap demonstrates a massive market failure and confirms the need for this pioneering service in Sitio Jolo, Barangay Bubog, San Jose, Occidental Mindoro. The projected yearly demand for 2027 is calculated at 1,383 enrollees (Figure 1) with an increase of 10% yearly. annual increase in the estimated size of the potential market, which includes new license applicants from nearby schools and employees of registered business establishments within the primary trade area of Sitio Jolo, Barangay Bubog, San Jose, Occidental Mindoro. As shown in the data, demand is estimated at a conservative 10% annual rate throughout the period, driven by a stable population growth rate and increased economic activity in the province, which, in turn, increases skills and mobility (Rahman, 2020).

In contrast, the projected yearly supply of legally structured, LTO-accredited driving school services is extremely low. It is calculated starting from a very small base of only 3 existing driving schools in 2027. This supply is projected to increase by 18% annually, reaching projected levels by 2031. This accelerated 18% growth in supply, significantly faster than the 5% growth in demand, is primarily due to the recent and mandatory LTO regulations. These mandates now require all new license applicants to complete formal Theoretical Driving Courses (TDC) and Practical Driving Courses (PDC) before obtaining a student permit. This essential regulatory shift has created a powerful non-negotiable legal requirement. Consequently, the high 18% growth rate in supply does not represent an increase of entirely new large-scale competitors, but rather the essential formalization, accreditation, and registration of previously informal instructors and small operators who are now legally required to formalize their business entities to provide these mandated certificates (Land Transportation Office, 2019).

Despite the higher growth rate in supply (18%), the actual base numbers remain too small to serve the market (Gray, 2025) effectively. A highly significant Demand and Supply Gap, starting at 1,518 unserved or underserved applicants in 2027 and widening to 2,219 by 2031. With this persistent, massive shortage leading to a staggering 30% shortfall in market demand, the proponent's conservative estimate is to capture a professional and achievable 10% market share during its pioneering stage of operations in this essential and growing market. With 30% of demand unsatisfied, the conservative estimate is 10% market share.

Graph of the Market Share

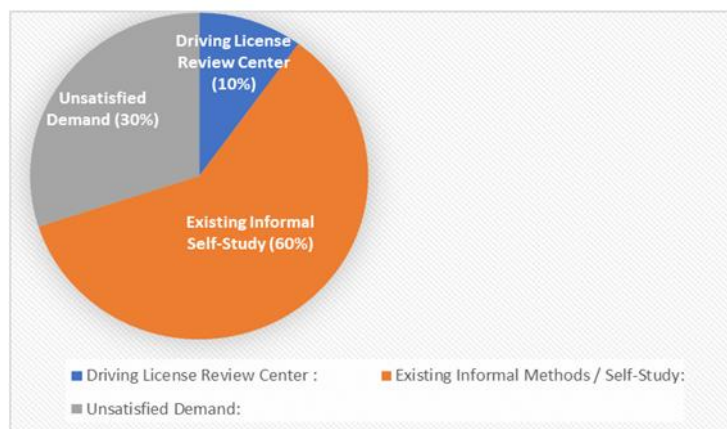


Figure 2. Graph of Market Share

The graph of the market share, titled "License Review Center," indicates that License Review Center will capture a 10% share of the total market in Central Mindoro. The existing market is currently served by informal review methods or self-study, which accounts for 60% of the accounting. However, it remains a significant 30% unsatisfied demand, representing potential applicants who currently lack access to professional, localized review facilities. As a new entrant in the service sector, the proponent has set a realistic and strategic target of 10% market share for the initial years of operation. This conservative approach ensures that the center can maintain high-quality instruction and a high passing rate for its enrollees, which is crucial for building the brand's reputation in the province (Okeke et al., 2024).

The feasibility of achieving 10% market share is supported by the data in Table 1, which presents the total

population and indicates growth potential. Capturing 10% of this demand is highly attainable given the mandatory nature of LTO theoretical requirements and the strong preference of students and professional drivers for structured, expert-led exam preparation. Also, the proponent wants to be realistic as a new player in the industry. While there is a 30% gap in the market, the proponent is not aiming to capture the entire gap immediately. Most of the data show that even with just 10% of the market, the business is fully sustainable. The proponent is choosing a conservative start to ensure long-term success rather than overpromising and under-delivering on our service. By addressing a portion of the 30% unsatisfied demand, the center serves as a vital link in improving road safety and licensing success in the province.

Marketing Strategies - Marketing strategy refers to a long-term action plan designed to attract, serve, and retain target customers by creating a competitive advantage in the market (Sintani et al., 2023). For the Feasibility Study on Establishing a Driver's License Review Center in Occidental Mindoro, the marketing strategies are formulated based on the identified demand, the limited local supply, and the strong interest among prospective driver's license applicants. The proposed center aims to position itself as the first structured and examination-focused review facility in the municipality. To ensure feasibility and sustainability, the following marketing mix strategies will be implemented:

Service. A service is a non-tangible offering designed to satisfy the needs of a specific market segment (Zeithaml et al., 2018). The proposed Driver's License Review Center will provide structured, comprehensive review plans tailored to the Transportation Office (LTO) written examination. Services will include lectures on traffic rules and road signs, multiple-choice examination drills, mock written tests, basic practical driving orientation, and printed and digital review materials. Unlike driving schools that focus mainly on Theoretical Driving Courses (TDC) and Practical Driving Courses (PDC), the proposed center will specialize in exam preparation. Given that a significant number of applicants have taken the examination multiple times, the service will focus on improving first-time passing rates. The center will offer classroom-based group sessions as the primary format, while also considering hybrid options to accommodate different learning preferences.

Price. Pricing. It is a critical factor in attracting and retaining customers (Noorsyah et al., 2024). Based on survey findings, the majority of respondents are willing to pay ₱1000 for review services. Therefore, the proposed center will adopt a competitive, affordable pricing strategy aligned with the target market's acceptable price range. The program is designed to remain accessible, particularly since a large portion of the target market consists of students and first-time applicants. Discounts may be offered for group enrollments and repeat examinees. This pricing approach ensures affordability while maintaining operational sustainability and competitiveness within the local market.

Place. Location plays a significant role in business success as it directly affects accessibility, visibility, and customer convenience (Bvarta, 2025). The proposed Driver's License Review Center will be strategically located within the commercial area in San Jose's. The chosen lotio, Jolo, Barangay Bubog, San Jose, Occidental Mindoro, will be accessible to students, transport workers, and walk-in applicants, preferably located near schools, transportation terminals, and government offices. A centrally located facility will increase foot traffic and enhance brand visibility. Accessibility via public transportation and proximity to areas where license applicants frequently conduct business will provide a strategic business advantage. Proper signage and a visible storefront will further strengthen market presence.

Promotion. Promotion strategies will focus on cost-effective and high-impact channels suitable for the target market (MacNeil, 2026). Since the majority of prospective enrollees are young adults and students, social media marketing will be the primary promotional tool. The center will create official social media pages to post review schedules, testimonials, mock test samples, and promotional announcements. Additionally, printed tarpaulins and flyers will be displayed and distributed in strategic areas, such as schools, transportation hubs (including terminals), and community bulletin boards. Word-of-mouth marketing will also be encouraged by offering referral incentives to successful enrollees. These combined promotional strategies will enhance awareness and attract consistent

enrollment.

People. People are a vital component of service-oriented businesses (Vuong, 2022). The proposed project will hire qualified instructors with strong knowledge of traffic laws, road safety regulations, and examination formats. Instructors must possess effective communication skills, patience, and the ability to simplify complex concepts for better understanding. Administrative staff will also be trained to provide professional customer service, efficient enrollment processes, approachable personnel, credible reviews, improved student satisfaction, and an enhanced reputation in the community. High service quality will ultimately contribute to higher passing rates and positive word-of-mouth referrals. Overall, the proposed marketing strategies are aligned with the identified market demand and the operational objectives of the Driver's License Review Center. By offering specialized services, affordable pricing, strategic location, effective promotion, and competent personnel, the project demonstrates strong marketing feasibility in San Jose, Occidental Mindoro.

Service Description - The proposed Driving License Review Center in San Jose will provide a structured, exam-focused review to improve applicants' knowledge of traffic laws, road signs, and safe driving principles. The service is intended to address the increasing number of driver's license applicants—particularly tricycle and motorcycle drivers—who demonstrate practical driving experience but limited theoretical understanding, resulting in knowledge gaps. In support of the LTO's programs and standards, the center will offer GUI programs and standards, lectures, mock theoretical examinations, and simplified discussions of traffic regulations to enhance comprehension and examination readiness. The exams align with the requirements of Republic Act No. 4136 and Republic Act No. 10930, which mandate competency-based licensing and adequate knowledge of road safety rules before license issuance. By providing localized, systematic, and values-oriented instruction, the review center aims to promote genuine learning rather than mere memorization of answers. Ultimately, the service seeks to improve passing rates, strengthen compliance with traffic laws, and contribute to the development of a more responsible, more cautious driving culture within the municipality.

Examination and Application Process - The proposed Driving License Review Center in San Jose will adopt a simple, structured, and systematic review process designed to prepare applicants for the theoretical examination administered by the Land Transportation Office (LTO). The process is organized into clear and sequential steps to ensure that each enrollee receives proper guidance, comprehensive instruction, and sufficient practice before taking the actual examination. It focuses on strengthening knowledge of traffic laws, road signs, and safe driving principles while improving test-taking confidence. Through this organized approach, the center aims to improve examination performance and promote responsible, informed driving within the municipality. Step 1: Registration; The applicant inquires about the review program, schedule, and fee. They complete the registration form and pay the required fee. The applicant is then officially enrolled and provided with the review schedule and materials. Step 2: Lecture Session (Review Proper): The instructor conducts structured classroom discussions covering traffic rules and regulations, road signs and markings, right-of-way rules, and common traffic violations and penalties. Lessons are explained clearly and in simple terms to ensure understanding. Step 3: Practice Examination: Applicants take practice multiple-choice tests similar to the actual written examination. The instructor reviews the answers and explains incorrect responses to strengthen comprehension. Step 4: Final Mock Examination: A final mock exam is administered to assess the applicant's readiness for the actual LTO written examination. Results are discussed to determine if the applicant is prepared or needs additional review. Step 5: Examination Tips and Final Reminders: Applicants receive practical test-taking tips, reminders about required documents, and guidance on proper conduct during the examination.

Table 6 lists the machinery and equipment, furniture and fixtures, and office supplies to be used in this Ftoy study. The machinery and equipment are essential resources for the restoration of the proposed Driving License Review Center in San Jose, Occidental Mindoro. These tools support the conduct of review sessions, practice theoretical examinations, and effective instruction on traffic laws and road safety. Computer units allow reviewees to practice for computer-based examinations, while the printer-scanner is used to produce learning materials and documents. The LCD projector and projection screen help present lessons and visual materials, while

the Wi-Fi connection provides access to online resources. The sound system ensures clear communication during lectures. Overall, these resources help create a technology-supported learning environment that improves drivers' preparedness for the theoretical examination.

Table 6*Machinery and Equipment, Furniture and Fixtures, and Office Supplies*

Specifications	Quantity	Cost per Unit	Total Cost
Machinery and Equipment			
Laptop (1 unit)	1	35,000.00	₱35,000
Printer with Scanner	1	10,000.00	₱10,000
TV	1	25,000.00	₱25,000
TOTAL			₱70,000
Furniture and Fixtures			
SPECIFICATIONS	QUANTITY	COST PER UNIT	TOTAL COST
Student Chairs with Armrest (20–30 pcs per batch)	30	250.00	₱7,500.00
Instructor's Table and Chair	2	3,000.00	₱6,000.00
Office Table and Chair (Administrative Staff)	3	3,000.00	₱9,000.00
Bookshelves or Storage Cabinets	2	4,000.00	₱8,000.00
Whiteboard with Markers and Eraser	1	2,000.00	₱2,000.00
Bulletin Board	1	1,000.00	₱1,000.00
Wall Clock	1	200.00	₱200.00
Air-conditioning Unit	1	20,000.00	₱20,000.00
Electric fan	1	1,500.00	₱1,500.00
Proper Lighting Fixtures	1	3,000.00	₱ 3,000.00
TOTAL			₱58,200.00
Office Supplies			
SPECIFICATION	QUANTITY	UNIT	UNIT COST
Bond paper (A4)	10	ream	₱249.00
Bond paper (long)	10	ream	₱269.00
Folder (long)	2	ream	₱450.00
Brown envelope(long)	2	ream	₱900.00
Fastener	10	Box	₱50.00
Puncher	1	pc.	₱220.00
Stapler	2	pc.	₱70.00
Whiteboard Marker	60	pc	₱70.00
Eraser	12	pc	₱30.00
Ballpen	2	Box	₱80.00
Ink	2	Set	₱1,039.00
TOTAL			₱14,638.00

Moreover, the furniture and fixtures listed in Table 4 are essential for creating a comfortable, organized, and functional learning environment for the proposed Driving License Review Center in Occidental Mindoro. These items support both instructional and administrative activities necessary for the center's operations. Student chairs, instructor tables, and office furniture provide adequate seating and workspace for learners, instructors, and administrative staff during review sessions and daily operations. Storage facilities such as filing cabinets and bookshelves help organize important documents, learning materials, and review resources. The proposed equipment, furniture, and fixtures are essential to ensure the efficient and professional operation of the Driving License Review Center in San Jose. Computer units, a printer with a scanner, and a reliable internet connection are necessary to administer mock examinations, process registrations, maintain student records, and prepare review materials. An LCD projector with a projection screen, supported by a sound system, is vital for delivering clear and interactive lectures, particularly when presenting traffic signs, road situations, and examination scenarios aligned with the standards of the Land Transportation Office (LTO). These tools enhance learning effectiveness and ensure that review sessions are structured and examination-focused.

Since the proposed project focuses on providing structured review services for driver's license applicants, the identified office and instructional supplies are necessary to support daily operations and instruction. Bond paper will be used for the school's daily operations and instructional activities, as well as for printing review materials, mock examinations, answer sheets, registration forms, and certificates of completion. These printed materials are essential in conducting practice tests that simulate the actual examination administered by the Land Transportation

Office (LTO). Envelopes and folders are required to maintain organized filing of student records, payment receipts, assessment results, and other administrative documents. Proper documentation ensures systematic recordkeeping, confidentiality, and easy retrieval of files when needed. Additional basic supplies, such as pens, markers, and record books, are also important for class discussions, attendance monitoring, and administrative tasks. Overall, these tasks are essential to maintaining efficiency, professionalism, and smooth daily operations of the review center (Daghan & Sundram, 2023).

Office Development Plan - The chosen space rental covers 180 square feet and is old, requiring some renovations. Table 7 lists the materials, labor costs, supplies, and redecoration costs for the proposed office.

Table 7
Renovation and Redecoration Supplies

MATERIALS	QUANTITY	COST PER UNIT	TOTAL
Paint	4 liters	₱250.00	₱1,000.00
Dipper	1	₱70.00	₱70.00
Pail	1	₱100.00	₱100.00
Handsoap	2	₱150.00	₱300.00
Doormat	5	₱30.00	₱150.00
Broom	1	₱150.00	₱150.00
Mop	1	₱350.00	₱350.00
Light Bulb	3	₱120.00	₱360.00
Labor Repaint	2 pax	₱500.00	₱1,000.00
TOTAL			₱3,480.00

The space will be rented to the landlord for ₱7,000.00 monthly. The initial payment will be 1 month advance and 1 month deposit. It is agreed that upon renewal, an annual increase of 5% will be imposed.

Location

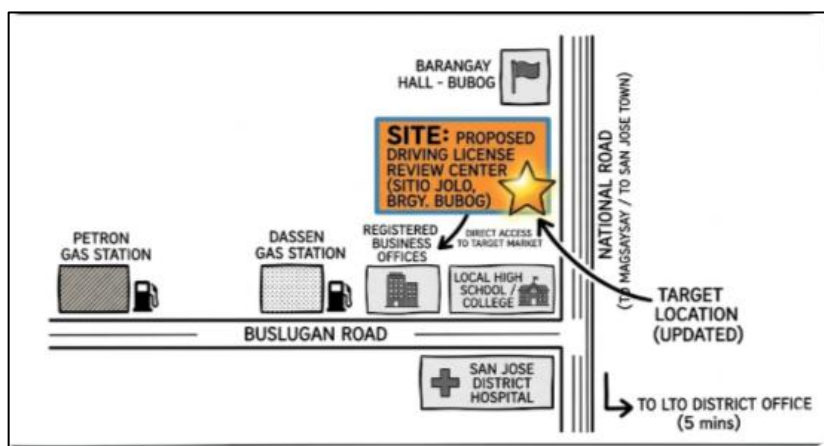


Figure 3. Vicinity Map of the Proposed Business

Exhibit 1 shows the vicinity map of the proposed Driving License Review Center, which is located in Sitio Jolo, Barangay Bubog, San Jose, Occidental Mindoro. The property is highly accessible through the National Road, the primary provincial artery connecting the town proper of San Jose to neighboring municipalities. Establishing the review center in this area provides a strategic advantage, as Sitio Jolo is a central hub with numerous registered businesses and educational institutions. This places the firm in proximity to students and professionals who require mandatory licensing reviews. Furthermore, the site is conveniently located near the San Jose District Hospital and is only a five-minute commute to the LTO San Jose District Office. This geographical proximity enables enrollees to move seamlessly from their final review sessions to the licensing examination, significantly enhancing the center’s value proposition by providing convenience and accessibility. Organization and Financial Study

Forms of Business Ownership - A sole proprietorship is a form of business organization owned and managed by a single individual, who exercises full control over operations, decision-making, and management. Under

Philippine business regulations, a sole proprietorship is registered with the Department of Trade and Industry (DTI), and the owner assumes unlimited liability for the business's obligations, as they directly own the assets, receive all profits, and are personally responsible for any debts or losses incurred. Due to its simple registration process, minimal regulatory requirements, and centralized management structure, this type of organization is commonly adopted by small and start-up enterprises.

Personnel and Manpower Requirements - The proposed project will hire three (3) qualified and competent individuals who will handle the day-to-day operations: the manager, the raewer, and an Administrative staff member. The Manager is responsible for the overall supervision and management of the review center. He or they plan and control daily operations to ensure that services are delivered efficiently in accordance with the business's objectives, including financial management, budgeting, scheduling of review sessions, and procurement of supplies and equipment. Additionally, the Manager ensures compliance with local government requirements and coordinates with relevant agencies when necessary. The Manager also monitors staff performance, maintains service standards, and implements improvements to enhance client satisfaction and examination success rates. The Administrative Staff handles the front desk and clerical operations of the review center. Their primary responsibilities include assisting clients with inquiries, processing registrations, maintaining student records, and managing documentation. They are in charge of scheduling review sessions, preparing attendance sheets, issuing official receipts, and organizing files systematically for easy retrieval. The Administrative Staff also supports the preparation and reproduction of review materials and mock examination papers, ensuring smooth day-to-day office operations. The Examiner or Reviewer is responsible for delivering structured review sessions and preparing applicants for the theoretical driver's license examination. They conduct courses on traffic laws, road signs, safe driving practices, and relevant regulations. The Reviewer prepares mock examinations, evaluates results, and provides feedback to help applicants improve their understanding. Additionally, the Examiner explains complex concepts in simple terms, especially for tricycle and motorcycle drivers who may have limited formal training. The Reviewer plays a key role in reinforcing road safety awareness, discipline, and responsible driving behavior among applicants.

Source of Financing - The proposed business will be registered as a sole proprietorship. The initial capital outlay required to start operations is ₱328,285.00, which includes fixed assets totaling ₱128,200.00 and pre-operating expenses of ₱200,085.00. This capital will be sourced from the proponent's personal savings.

Table 8
The Proposed Business

Items	Description	Cost	Total Costs
Fixed Assets	Office and Computer Equipment	70,000.00	128,200.00
	Furniture and Fixtures	58,200.00	
Pre-Operating Expenses	Cost of Service	78,612.00	200,085.00
	Office Supplies and Materials Expense	14,638.00	
	Janitorial Supplies	1,500.00	
	Renovation and Redecoration Expenses	3,480.00	
	Rent Expenses	21,000.00	
	Transportation Expenses	4,500.00	
	Utilities Expense	14,550.00	
	Permits and Licenses	7,500.00	
	Promotional Expenses	3,000.00	
	Miscellaneous Expense	2,000.00	
	Employee Salary	45,000.00	
	Government Mandatory Contributions	4,305.00	
Total Project Cost			328,285.00

The initial project cost required to start business operations is ₱328,285.00. This includes the purchase of office and computer equipment, furniture, and fixtures totaling 128,200.00, and other expenses totaling 200,085.00. The total project cost covers the pre-operating expenses necessary to commence review operations, including the cost of service of the three personnel and government contributions, which are directly related to the operation of the review center; office and janitorial supplies; renovation and redecoration costs; rent; transportation; utilities;

permits and licenses; promotional expenses; miscellaneous; and salaries and mandatory government contributions of the admin personnel. The pre-operating expenses include three months' worth of employee salaries, mandatory government contributions, utilities, rent, and transportation expenses, as well as one year's worth of office and janitorial supplies and miscellaneous expenses. Costs for permits, licenses, promotional activities, and renovation and redecoration are also included in the capital outlay, as these are paid before the official start of the review operations.

Financial Assumptions - The basic financial assumptions of the study are: The proposed schedule consists of 10 reviewees per daily session, with 20 sessions conducted each month, resulting in a total of 200 reviewees per month, and an annual increase of 10%. The review fee is set at P1,000 in the first year, with an annual increase of 10%. In addition, the full payment of P1,000 will be paid at enrollment. There'll be 20 session days per month, or a total of 240 sessions per year. The straight-line method of depreciation will be used for office equipment, computer equipment, furniture, and fixtures, with a zero-salvage value and a five-year useful life. Office supplies, janitorial supplies, rent, transportation, utilities, miscellaneous, business permits and licenses, and promotional expenses will increase by 5% annually. Renovation and redecoration costs will be incurred in the first year before the start of operations. The salaries, government-mandated contributions, and 13th month pay of the instructors are treated as cost of service since they are directly involved in the core business operations. The salary, government-mandated contributions, and 13th month pay of the manager are treated as operating expenses since these relate to administrative functions that are not directly involved in service delivery. Salaries, 13th-month pay, and mandatory government contributions will increase by 2% annually. The proposed business will be registered as a non-VAT entity during the first two years of operations. It will transition to VAT registration from the third to the fifth year, as it is projected to exceed the ₱3,000,000 threshold for non-VAT taxpayers.

3. Financial Projections

Financial Ratios and Analyses

Gross Profit Ratio. Gross Profit Ratio is the ratio of a company's gross profit to the volume of sales attained during the same time frame. Sales prices have a significant impact on the gross profit margin; the more profitable the margin, the greater the firm's intended success. Finding out how much profit you make from each peso of the product's (goods and/or services) sale value is the goal of calculating the gross profit margin. Gross profit ratio is consistently higher than the net profit margin. (Mahruzal & Khaddafi, 2020). The five-year gross profit ratio shows that in the first year of operation, the business achieved an 86% GPR, indicating that for every peso of sales revenue, ₱0.86 represents gross profit. The subsequent years also reflect about 86% GP, showing consistency, thereby indicating the proposed business.

Net Profit Ratio. The company's management uses the profit ratio as the standard for determining sales earnings. Net Profit is a measure of a business's ability to generate profit from sales and a tool for making business-related decisions. This ratio describes the company's overall net income and is used to calculate income relative to sales. (Indrati & Putri, 211). The proposed business shows a net profit ratio of 65% in its first year of operations, suggesting that for every peso of revenue earned, the business generates ₱0.65 in net profit. The results in the succeeding years also indicate that the business remains highly profitable.

Return on Investment. Based on the above projections, 474% of the initial capital outlay will be recovered in the first year. This means that the total capital invested in the proposed business can be fully recovered within the first year, including a significant amount of profit. Return on investment (ROI) is a financial metric used to evaluate the profitability and performance of investments within a company. It means being financially successful by calculating the net gain or loss relative to the cost, given as a percentage (Majka, 2024).

Socio-Economic Aspects - The proposed Driving License Review Center in San Jose, Occidental Mindoro, will contribute to the community by improving drivers' knowledge of traffic laws and road safety. Through structured review sessions aligned with the Land Transportation Office's standards, the project will help applicants

better prepare for the driver's license examination. The business will also create employment opportunities and contribute to local economic activity through taxes and business permits. Overall, the project supports safer roads and promotes responsible driving within the municipality.

4. SWOT and Potential Problem Analysis

Strengths - One of the primary strengths of the proposed review center is the clear, existing demand for structured preparation for theoretical examinations among driver's license applicants in San Jose, particularly among tricycle and motorcycle drivers, creating a stable and sustainable market for review services. High failure rates in theoretical examinations indicate a knowledge gap that should be addressed. Another strength is the project's focused, localized approach. By tailoring instruction to the learning needs of local applicants, particularly those with limited formal education, the review center can provide simplified explanations of traffic laws, guided discussions, and simulated examinations that enhance comprehension rather than rote memorization. The project also aligns with national legal requirements governing driver competency. Since drivers must demonstrate sufficient knowledge of traffic laws before being issued a license under Republic Act No. 4136 and the strengthened licensing standards under Republic Act No. 10930, the review center operates within a legally supported framework. This alignment increases the legitimacy and relevance of the service. Additionally, the business model requires relatively moderate capital investment compared to other enterprises, as operations primarily involve instructional services, learning materials, and office space. This makes the project financially manageable and scalable.

Weaknesses - Despite its strengths, the proposed review center may encounter certain internal limitations. One potential weakness is dependence on the volume of license applicants. If the number of applicants temporarily declines, enrollment in review sessions may decrease, affecting revenue stability. Another weakness may be the diversity of clients' educational backgrounds, limited literacy skills, or difficulty understanding technical concepts, which may require additional time and effort to ensure comprehension. This may affect class pacing and operational efficiency. The project may also face limitations in initial market trust. As a new establishment, the center must build credibility and demonstrate effectiveness in improving examination performance. Without proven results during the early stages of operation, some applicants may hesitate to enroll. Furthermore, the review center does not directly control the examination system or question format administered by the Land Transportation Office. Any changes in examination procedures may require immediate adaptation of review materials and teaching methods.

Opportunities - The growing population of tricycle and motorcycle drivers in San Jose presents a significant opportunity for long-term sustainability. As transportation demand increases, more individuals will apply for new licenses or renew their licenses for review services. There is also an opportunity to expand services in the future. The center may offer refresher courses for license renewals, special review sessions for professional driver applicants, or seminars on traffic law updates and responsible driving practices. This diversification can broaden revenue sources and strengthen market position. Technological advancement presents another opportunity. The integration of computer-based mock examinations and digital learning materials can enhance service quality and attract younger applicants who are more comfortable with digital platforms. Moreover, increasing public awareness of road safety and compliance with traffic regulations creates a favorable environment for educational services focused on driver competence. As regulatory enforcement becomes stricter and examinations remain competency-based, applicants may recognize the importance of structured preparation.

Threats, Potential Problems, and Action Responses - In addition to the SWOT factors, the project must anticipate operational and external challenges, including low enrollment during the initial phase of implementation. As a new business, the review center must establish credibility and demonstrate effectiveness in improving examination results. Effective marketing strategies, testimonials, and partnerships with local transport groups may be necessary to build trust. Another potential issue is inconsistency in examination results. Even with structured review sessions, some applicants may still fail due to test anxiety, reading comprehension challenges, or individual

learning limitations. Managing customer expectations while continuously improving teaching methods will be essential. Instructor qualification and retention may also pose a challenge. The center must ensure that instructors are knowledgeable, up to date on traffic regulations, and capable of effective communication. Continuous training and professional development will be necessary to maintain instructional quality. Operational costs such as rental fees, utilities, internet services, and instructional materials must be carefully managed to maintain profitability. Proper financial planning and monitoring are necessary to prevent operational losses. Lastly, resistance to structured learning may be encountered among some drivers who believe that practical experience alone is sufficient. Changing this mindset requires consistent advocacy on the importance of theoretical knowledge in ensuring legal compliance and road safety.

Based on the SWOT and potential problem analysis, the proposed Driving License Review Center in Occidental Mindoro is viable and responsive to an existing need. While certain weaknesses and threats exist, they can be mitigated through proper planning, quality instruction, strategic marketing, and continuous adaptation to regulatory changes. The strengths and opportunities of the project—particularly the clear demand for structured theoretical preparation and the legal requirement for driver competency under Republic Act No. 4136 and Republic Act No. 10930—outweigh the identified limitations. With effective management and community engagement, the project has strong potential for sustainability and long-term contribution to responsible driving practices within the municipality...

5. Conclusions

Based on the findings of the study, the researcher has arrived at the following conclusions: Based on the respondents' high interest (95%) and the absence of specialized review centers in the area, the proposed Driving License Review Center targets a youthful, college-level, and economically active population, and with appropriate marketing strategies, strategic location, qualified instructors, and affordable pricing, the project is marketable and capable of generating stable demand. The proposed review center meets the competency-based licensing requirements under Republic Act No. 4136 and Republic Act No. 10930, demonstrating that it is technically feasible and aligned with national standards for theoretical driver education. The business is planned as a sole proprietorship, with the researcher as the sole owner and manager, ensuring clear supervision of instructional oversight, administrative processes, and financial management, making the organization appropriate and feasible. The project generates direct and indirect employment, provides government revenue, addresses applicants' educational needs, improves road safety, and contributes to livelihood security, demonstrating significant socio-economic benefits for the community of San Jose, Occidental Mindoro. The proposed review center requires moderate start-up capital and, based on projected enrollment and a ₱1,000-per-participant fee, is sustainable with potential for long-term profitability.

Recommendations - Based on the findings and conclusions presented in this study, the researcher recommends the following: Implement aggressive yet effective marketing strategies, particularly through social media platforms. The owner may consider partnerships with transport groups and information dissemination in schools and terminals to sustain strong enrollment levels. The owner may continuously enhance instructional materials and mock examination programs to improve first-time passing rates and maintain service credibility. The owner may hire and train competent instructors with strong communication skills and updated knowledge of traffic laws and examination formats to ensure high-quality service delivery. The management may regularly monitor financial performance and operational costs to maintain the proposed project's profitability and long-term sustainability. Thriving License Review Center in San Jose, Occidental Mindoro, is feasible and viable in terms of market demand, with respect to tuition, service relevance, and operational sustainability. Future researchers may explore future expansion to neighboring municipalities once operational stability and consistent enrollment levels are achieved.

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A feasibility study on the establishment of a Corn Feed Mill in Sablayan, Occidental Mindoro

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Abstract

Corn is a vital agricultural commodity and a primary feed ingredient essential to the livestock and poultry industry. In Occidental Mindoro, particularly in the municipality of Sablayan, the increasing number of corn farmers and animal raisers highlights the need for a reliable, accessible, and cost-effective supply of animal feed. This feasibility study evaluated the establishment of a Corn Feed Mill in Sablayan, Occidental Mindoro, focusing on market potential, technical requirements, financial viability, and socio-economic impact. A descriptive research design was employed using survey questionnaires, interviews with key stakeholders, and secondary data gathered from books, journals, feasibility studies, and government publications. The results revealed a strong and growing demand for locally processed corn-based feeds, driven by the expanding livestock and poultry sector and the high cost of feeds sourced from other provinces. The technical analysis confirmed the availability of suitable production sites, a sufficient supply of raw materials, and access to skilled labor within the municipality. Financial projections further indicated that the proposed Corn Feed Mill is financially viable, with favorable returns on investment and profitability expected during the early years of operation. Beyond financial gains, the project is expected to create employment opportunities, increase local corn utilization, provide assured market linkages for farmers, and contribute to Sablayan's overall economic development. Based on the market, technical, financial, and socio-economic analyses, the study concludes that establishing a Corn Feed Mill in Sablayan, Occidental Mindoro, is both feasible and promising. It is recommended that the project strengthen partnerships with local farmers, adopt efficient milling technologies, and actively engage with government support and industry training programs.

Keywords: corn feed mill, livestock and poultry, local feed production, agricultural development, financial viability

A feasibility study on the establishment of a Corn Feed Mill in Sablayan, Occidental Mindoro

1. Introduction

The livestock and poultry industries are vital components of the Philippine agricultural economy, providing meat, eggs, and other animal products essential to food security and the livelihoods of rural communities (Philippine Statistics Authority (PSA), 2026). The success and profitability of these industries largely depend on the availability of affordable and high-quality animal feed, which accounts for approximately 60–70% of total production costs. Among feed ingredients, yellow corn is the primary energy source and a crucial component in formulating balanced rations for poultry and livestock (Philippine Institute for Development Studies, 2023).

In the MIMAROPA region, the Philippine Statistics Authority (2024) has provided data on Corn Production, Harvested Area, and Yield in MIMAROPA for 2023–2024. The Regional Statistical Services Office MIMAROPA reported that Occidental Mindoro has consistently emerged as the leading corn-producing province, contributing nearly 75% of the region's total corn output. In 2024, the province produced 79,408 metric tons (MT) of corn, reflecting a 20.1% decline from 99,390 MT in 2023, due to reduced harvested area and environmental challenges. Of this production, 98.2% was yellow corn, which is primarily used for animal feed. During the fourth quarter of 2024, the province harvested 3,976.9 MT of corn across 1,171.9 hectares, achieving an average yield of 3.39 MT/ha, exceeding the MIMAROPA regional average of 2.81 MT/ha. However, the total harvested area declined by 12.8%, reflecting the province's vulnerability to seasonal drought, pest infestations, and shifting land use. For the year, Occidental Mindoro devoted 18,285 hectares to corn cultivation, accounting for 67.8% of MIMAROPA's total corn-growing area (PSA, 2026).

Despite being the largest corn producer in the region and a major consumer of animal feeds, Occidental Mindoro currently lacks a local feed mill (Ukaoha, 2023). Poultry and livestock raisers rely on feed sourced from outside the province, resulting in higher transportation costs, exposure to price fluctuations, and occasional supply delays. Establishing a Corn Feed Mill within the province would maximize its agricultural potential, provide a stable local market for corn farmers, and ensure a consistent, affordable feed supply for the growing livestock and poultry sectors. This project presents significant opportunities, including adding value to local corn production by increasing market prices and reducing post-harvest losses; supporting the poultry and livestock industries through a steady supply of high-quality feed; generating employment and stimulating rural economic development; and enhancing food security and agricultural sustainability by reducing dependence on imported feed.

In summary, Occidental Mindoro's dominance in MIMAROPA corn production, combined with its substantial feed demand and lack of a local feed mill, presents a strong case for establishing a corn feed milling facility. By converting locally produced yellow corn into high-value animal feeds, the project will stabilize supply, lower feed costs, strengthen the poultry and livestock industries, create rural employment, and contribute to inclusive and sustainable economic growth.

Objectives of the Study - The general objective of this feasibility study is to assess the viability of establishing a Corn Feed Mill in Occidental Mindoro to maximize the province's corn production, support the poultry and livestock industries, and promote sustainable economic growth in the region. Specifically, this study aims to (1) Evaluate the current status of corn production in Occidental Mindoro in terms of volume, yield, and land utilization and determine its capacity to sustain a local feed mill. (2) To establish a cooperative-managed corn feed mill and determine its management structure and operational manpower requirements. (3) Analyze the demand for animal feeds in the province, particularly in the poultry and livestock sectors, and identify market gaps that a local feed mill can address. (4) Determine the technical and operational requirements for establishing a corn feed mill, including location, production capacity, equipment, and manpower. (5) Assess the financial feasibility of the

project by estimating capital investment, operating costs, revenues, and profitability. (6) Examine the socio-economic and environmental benefits of setting up a feed mill, such as job creation, farmer income improvement, reduced feed importation, and enhanced local food security.

Significance of the Study - The proposed establishment of a Corn Feed Mill in Sablayan, Occidental Mindoro, is of great importance to various stakeholders in the agricultural and economic sectors. This study will provide essential insights and serve as a valuable basis for informed decision-making, planning, and investment toward the sustainable development of the province's livestock, poultry, and corn industries. For the Corn Farmer, the study will highlight the potential to create a stable, reliable local market for yellow corn, thereby ensuring better farmgate prices, reducing post-harvest losses, and encouraging farmers to expand production. By having a local buyer through the feed mill, farmers can enjoy increased income and improved livelihood stability. For Livestock and Poultry Raisers, local production of quality, affordable feeds will reduce dependence on imported or externally sourced feed products. This will help reduce production costs, ensure consistent supply, and enhance profitability and productivity among local raisers, contributing to the overall growth of the animal industry in the province. For the Local Economy and Community, the feed mill is expected to generate employment opportunities across corn production and transportation, feed manufacturing, and distribution. This will stimulate local economic activity, promote value-added industries, and strengthen the province's agribusiness sector, aligning with rural development and poverty-reduction goals. For the Provincial and Regional Governments, the findings of this study will provide data-driven insights that can guide agricultural planning, policy formulation, and investment prioritization. Establishing a feed mill aligns with the government's objectives of achieving food security, self-sufficiency, and sustainable agricultural development in MIMAROPA. For Future Researchers and Planners, the studies will serve as a valuable reference for future feasibility studies, policy analyses, and academic research on agricultural processing, agribusiness ventures, and regional economic development. In summary, this feasibility study is significant as it provides a comprehensive evaluation of the potential benefits of establishing a Corn Feed Mill in Occidental Mindoro, empowering farmers; supporting livestock and poultry industries, creating jobs, strengthening local economies, and advancing the province toward agricultural sustainability and food security.

Scope and Delimitation of the Study - This feasibility study assessed the technical, financial, market, and socio-economic viability of establishing a Corn Feed Mill in Sablayan, Occidental Mindoro. It encompassed the evaluation of local corn production capacity, the demand for poultry and livestock feeds, operational, technical, and financial requirements such as location, equipment, workforce, and production processes; as well as the potential economic, social, and environmental benefits for corn farmers, feed consumers, and the wider community. The study involved the collection and analysis of both primary and secondary data. The primary data were gathered from selected respondents consisting of three hundred seventy (370) local corn farmers, representing a sample from the province's approximately 9,498 registered corn farmers, to determine their average yield, post-harvest practices, and willingness to supply corn to a local feed mill; three hundred fifty-one (351) poultry and livestock farm owners, representing a sample from 3,951 registered hog and poultry raisers, to assess feed requirements, sourcing practices, and issues concerning feed costs and availability; and one hundred (100) local traders or feed distributors, to provide insights on market pricing, supply chains, and potential competition for the proposed feed mill. However, the study was limited by the availability, accuracy, and timeliness of secondary data from government and institutional sources, as well as potential response bias among surveyed participants. The scope was geographically confined to the province of Occidental Mindoro. External factors such as fluctuations in corn and feed prices, climatic and environmental conditions affecting production, technological advancements in feed milling, and potential changes in national and local government policies may influence the project's actual outcomes, implementation, and long-term sustainability beyond the parameters of this study.

2. Methodology

This study employed a descriptive research design to assess the market potential, technical requirements, and financial feasibility of establishing a Corn Feed Mill for Poultry and Livestock Production in Occidental Mindoro. Data were collected through surveys, interviews, and secondary sources to provide a comprehensive analysis of

the corn and livestock industries in the province. The survey preparation and on-site field implementation were carried out within one month, covering all nine (9) municipalities of mainland Occidental Mindoro. The overall feasibility study was completed within two (2) months. This timeframe included the development of structured survey instruments to ensure the accuracy, clarity, and relevance of the data collected; coordination with local stakeholders; conduct of field surveys; data collection; and the initial validation of survey responses. Upon approval, printed questionnaires were distributed to local corn farmers and poultry and livestock raisers, focusing on their production capacity, feed consumption patterns, sourcing practices, and market-related challenges. The primary respondents consisted of three hundred seventy (370) local corn farmers, representing a computed sample size from the total 9,943 registered corn farmers as recorded by the Office of the Provincial Agriculturist. They were surveyed to determine their average yield, post-harvest practices, and willingness to supply corn to a local feed mill. Three hundred fifty-one (351) poultry and livestock farm owners, representing a sample of the province's 3,951 registered hog and poultry raisers, were considered to gather insights on feed requirements, sourcing practices, and issues concerning feed costs and availability. The respondents were distributed across municipalities using proportional allocation based on the number of registered farm owners in each municipality. One hundred (100) local traders/market vendors and feed distributors provided information on market pricing, supply chains, and potential competition for the proposed feed mill. The respondents were distributed per municipality based on the number of registered stores, sellers, and feed distributors within each municipality. In addition to primary data, secondary information was obtained from the Philippine Statistics Authority (PSA), Department of Agriculture (DA), and local government units, focusing on corn production statistics, land utilization, and livestock population. Complementary references from online journals, industry articles, and feasibility studies on feed milling and agribusiness were also reviewed to support the study. All collected data were systematically analyzed to assess the sufficiency of local corn supply, demand for animal feed, and the projected financial viability of the proposed feed mill. The researcher ensured that all responses were treated with strict confidentiality and were used exclusively for this study.

Sources of Data - This study utilized both primary and secondary data to comprehensively assess the feasibility of establishing a Corn Feed Mill in Sablayan, Occidental Mindoro. Primary Data were collected through surveys and interviews conducted among key stakeholders in the province's agricultural sector. The primary respondents consisted of three hundred seventy (370) local corn farmers, representing a sample drawn from approximately 9,943 registered corn farmers, to determine their production capacity, post-harvest practices, and willingness to supply corn to a local feed mill; three hundred fifty one (351) poultry and livestock farm owners, representing a sample of the province's 3,951 registered hog and poultry raisers, to gather information on feed requirements, sourcing methods, and challenges related to feed costs and supply; and one hundred (100) local traders and feed distributors, who provided insights on market prices, distribution channels, and potential competition. The survey data were gathered using structured questionnaires and interviews.

Secondary Data were obtained from credible government agencies, institutional records, and published materials, including the Philippine Statistics Authority (PSA), Department of Agriculture (DA), Provincial Agriculture Office of Occidental Mindoro, Department of Trade and Industry (DTI), Bureau of Animal Industry (BAI), and other relevant research studies, journals, and reports. These sources provided essential data on corn production volumes, livestock and poultry population, feed consumption trends, and economic indicators necessary for market and financial analyses. The combination of primary and secondary data enabled a comprehensive, evidence-based evaluation of the technical, market, and financial feasibility of establishing a Corn Feed Mill aligned with Occidental Mindoro's agricultural strengths and economic priorities.

Ethical Consideration - This study strictly adhered to established ethical standards in research to ensure the integrity, credibility, and protection of all participants involved. Before conducting surveys and interviews, the researcher obtained informed consent from all respondents after fully explaining the purpose of the study, the voluntary nature of their participation, and their right to refuse or withdraw at any stage without penalty or prejudice. All information gathered was treated with utmost confidentiality and used solely for academic and research purposes. To protect respondents' privacy, no personal identifiers, such as names, addresses, or contact

details, were disclosed or included in any part of the study. Data collected were securely stored, accessible only to the researcher, and properly disposed of after the study's completion to prevent unauthorized access or misuse. The researcher ensured that there was no coercion, manipulation, or harm to any participant. All questions were designed to be respectful, relevant, and non-intrusive, allowing respondents to express their views freely. Professional conduct was observed throughout the data-gathering process to maintain fairness, neutrality, and objectivity in both data collection and interpretation.

Moreover, this study complied with the provisions of the Data Privacy Act of 2012 (Republic Act No. 10173) and its Implementing Rules and Regulations (IRR), ensuring the lawful, transparent, and ethical processing of personal data. The principles of legitimate purpose, transparency, and proportionality were strictly observed in the handling of respondent information, ensuring that data privacy rights were respected and protected at all times. In line with these ethical commitments, the research upholds the principles of respect for persons, beneficence, and justice, ensuring that the study contributes meaningfully and responsibly to the advancement of agricultural and rural development in Occidental Mindoro while maintaining the dignity, rights, and welfare of all respondents.

3. Market Study

Market Description - The animal feed industry is a vital component of the Philippine agricultural economy, serving as the nutritional backbone for poultry and livestock production. According to the Department of Agriculture (DA), the feed milling sector is primarily driven by demand from the poultry, swine, and aquaculture industries, which collectively consume more than 17 million metric tons (MT) of feeds annually. Yellow corn comprises approximately 50–60% of most feed formulations, functioning as the primary energy source, while soybean meal, rice bran, and fishmeal are commonly used as protein supplements. Department of Agriculture (2023) - Philippine poultry (layer) industry roadmap 2022–2040. In recent years, the demand for animal feed in the Philippines has grown steadily due to population growth, urbanization, and rising meat consumption. Although the MIMAROPA region is less industrialized than other regions, it has significant potential for developing the feed industry due to its active livestock and poultry sectors. However, feed milling operations in the area remain limited, with most commercial feeds being sourced from nearby provinces such as Batangas and Laguna. The livestock and poultry industries of Occidental Mindoro are among the key drivers of the province's agricultural economy, providing meat, eggs, and livelihood opportunities for rural communities. Over the years, these industries have grown steadily due to increasing consumer demand. However, they continue to face challenges from high feed prices and dependence on imported or out-of-province supplies.

In terms of area and productivity, the province consistently devoted an average of 18,000 to 19,500 hectares of land to corn cultivation between 2021 and 2024, representing about two-thirds of MIMAROPA's total corn-growing area. The average yield of 3.39 metric tons per hectare in 2024 remains above the regional average of 2.81 MT/ha, indicating strong production efficiency despite adverse environmental conditions. These figures highlight the province's capability to sustain a reliable and continuous supply of corn that can support a local feed mill operation (Philippine Statistics Authority (PSA), 2021–2024 Provincial Corn Production Reports). At present, Occidental Mindoro raisers rely heavily on feed supplies sourced from nearby provinces such as Batangas, Laguna, and Bulacan, which increases transportation and handling costs and exposes them to supply and price fluctuations. Establishing a local feed mill would help stabilize prices, ensure timely availability, and reduce logistical expenses for the farming sector. On the supply side, Occidental Mindoro continues to be the top corn-producing province in the MIMAROPA Region, contributing approximately 70–75% of the region's total corn output. Corn production data from the Philippine Statistics Authority (PSA) from 2021 to 2024 are summarized below:

Table 1 shows corn production per unit area. These data confirm that Occidental Mindoro maintains a strong production base, with an average yield higher than the MIMAROPA regional average of 2.81 MT/ha. Approximately 98.2% of total production consists of yellow corn, which serves as the principal energy ingredient for animal feeds. The province's extensive corn-growing areas and consistent yields provide a secure and abundant supply of raw materials for feed mill operations.

Table 1
Corn Production per Yield (MT/Ha)

Year	Area Harvested (ha)	Production (MT)	Average Yield (MT/ha)	Remarks
2021	19,580	102,560	3.36	Favorable weather conditions; stable output
2022	18,960	96,870	3.26	Slight decline due to input costs and pest incidents
2023	18,730	99,390	3.31	Recovery in production; strong yellow corn output
2024	18,285	79,408	3.39	Decline due to drought, reduced area, and land conversion

Source: Philippine Statistics Authority (PSA), 2021–2024 Provincial Corn Production Reports

Respondents of the Study - The distribution of corn farmers per municipality in Occidental Mindoro. The sample size was determined using the Raosoft Sample Size Calculator, with a 95% confidence level, a 5% margin of error, and a 50% response distribution. Out of 9,943 registered corn farmers (Office of the Provincial Agriculturist, 2024), the computed representative sample size was 370 respondents. This sampling aimed to obtain reliable feedback regarding potential sources of corn supply for the proposed feed mill. A proportionate stratified sampling approach was employed to ensure that the sample accurately reflects the population of corn farmers across all municipalities, with the total sample size allocated to each municipality in proportion to its share of the total population. This method ensures that each municipality is represented according to its size, thereby improving the accuracy, validity, and generalizability of the study’s findings. The results from this proportional distribution were applied to determine the average corn yield per municipality, assess post-harvest practices and willingness to supply corn to the proposed feed mill, inform the feed mill’s procurement strategy, including sourcing priorities and potential partnerships with farmers in high-yield municipalities, and enhance the reliability of socio-economic and market analyses by reflecting the perspectives of farmers in both large and small municipalities. By using proportional allocation, the study ensures that findings are representative of the entire province rather than biased toward larger or more accessible municipalities.

Table 2
Distribution of Respondents Willing to Supply Corn to a Proposed Local Feed Mill

Municipality	Traders	Outside Mindoro	Local Feed Miller
Abra De Ilog		14	27
Paluan			20
Mamburao			74
Sta. Cruz	2	5	187
Sablayan	6	12	3
Calintaan			7
Rizal			6
San Jose			7
Magsaysay			331
TOTAL	8	31	

Table 2 presents the respondents’ willingness to supply their harvested corn to the proposed local feed mill in Occidental Mindoro. Results show a highly favorable response, with 331 out of 370 respondents (89.46%) expressing readiness to sell to the local feed mill, while only 8 (2.16%) preferred local traders and 31 (8.38%) sold outside the province. The findings indicate strong farmer support for establishing a local feed mill, citing fair pricing, reduced transportation costs, and easier market access as key advantages (Aku et al., 2018). Respondents also noted that a local feed mill could help stabilize and increase corn prices by reducing the influence of traders who often impose low buying rates. Overall, the data confirm a positive outlook toward the proposed project, underscoring its feasibility and potential to enhance farmer income, promote fair competition, and strengthen the corn industry in Occidental Mindoro.

Table 4 presents the estimated feed consumption per head for various livestock and poultry species, based on interviews conducted with local raisers in Occidental Mindoro. The data reflect the average feed consumption per animal type over a typical production cycle or year, depending on the production purpose. As shown, swine breeders (sows and boars) require the most feed, consuming approximately 1,000 to 1,200 kilograms per head

annually due to their continuous maintenance and reproductive functions (Piles et al., 2025). Fatteners follow with an estimated 300 kilograms per head per cycle, while piglets consume around 45 kilograms before reaching the grower stage. For poultry, layers and game fowls exhibit relatively higher feed intakes of 45 and 18 kilograms per head, respectively, given their longer maintenance periods. Native chickens consume around 12 kilograms per head, whereas broilers, raised for meat production over a short period, require approximately 5 kilograms per head per cycle. Meanwhile, ducks consume about 40 kilograms per head annually, reflecting their continuous feeding requirement for egg or meat production. Overall, the table serves as a vital reference in estimating the total feed demand within the province. These figures provide the basis for computing the aggregate feed requirement of all livestock and poultry populations, thereby supporting the market potential and economic feasibility of establishing a local corn feed mill enterprise in Occidental Mindoro.

Table 4
Respondents' Feed Consumption per Head

Type of Animal	Feed Consumption
Piglet	45 kg/head
Fattener	300 kg/head
Breeder Sow	1,000 kg/head
Breeder Boar	1,200 kg/head
Native Chicken	12 kg/head
Broiler	5 kg/head
Game Fowl	18 kg/head
Layer	45 kg/head
Duck	40 kg/head

Market Segmentation - Market segmentation in this study was conducted to identify and classify the distinct groups of feed consumers within the province of Occidental Mindoro. The segmentation was based on the number of livestock and poultry raisers, the population of animals raised, and the corresponding feed consumption per head. These variables were used to estimate the potential demand for feeds among different market segments.

Geographic Segmentation - The target market is distributed across the eleven municipalities of Occidental Mindoro. Among them, San Jose and Sablayan represent the major market areas, accounting for the largest number of raisers and livestock heads. These municipalities serve as the primary production hubs for both swine and poultry, accounting for approximately 70–75% of the province's total feed demand. (Source: 2024 Occidental Mindoro Inventory of Livestock and Poultry - Office of the Provincial Veterinarian) Secondary markets include Calintaan, Rizal, and Mamburao, which maintain moderate livestock production levels and contribute steadily to feed consumption—meanwhile, smaller municipalities such as Abra de Ilog, Paluan, and Sta. Cruz represents the tertiary market, composed mostly of smallholder backyard raisers with lower but consistent feed requirements.

Demographic Segmentation - The respondents in the study comprise 3,951 livestock and poultry raisers, of whom 2,820 are engaged in livestock production and 1,131 in poultry production. This distribution indicates a predominance of livestock raisers in the province, suggesting that swine feeds will account for a major share of the total market (Villanueva et al., 2025).

Product-Based Segmentation - Feed consumption varies according to the type of animal raised. Based on Table 6, swine, particularly fatteners and breeders, consume the most feed per head, ranging from 300 kg to 1,200 kg per cycle or year, making them the primary market segment. The secondary market consists of poultry producers, especially layers, broilers, and game fowl, which have significant and recurring feed needs. Layers consume an average of 45 kg/head/year, while broilers require about 5 kg/head per production cycle. Ducks and native chickens form the supplementary segment, with moderate consumption but broad distribution among backyard raisers (Source: 2024 Occidental Mindoro Inventory of Livestock and Poultry—Office of the Provincial Veterinarian). The province's feed market is characterized by a mix of commercial raisers and smallholder producers, with the latter forming the majority. Commercial raisers, concentrated in San Jose and Sablayan, demand bulk quantities of formulated feeds, while small-scale farmers purchase feeds in smaller volumes for daily or weekly use. This creates opportunities for both wholesale and retail feed distribution channels, allowing the proposed feed mill to

cater to diverse market needs. As a result, the segmentation indicates that the swine and poultry sectors constitute the core market for feed production in Occidental Mindoro. The concentration of raisers in San Jose and Sablayan enhances the feasibility of establishing a local feed mill within or near these municipalities. With approximately 10,000 metric tons of feed consumed annually, the segmented data demonstrates a robust and sustainable market base for the proposed corn feed mill project.

Demand Analysis - The demand analysis reveals a strong market potential for the proposed corn feed mill in Occidental Mindoro, supported by the province’s substantial livestock and poultry population. Swine breeders consume about 1,000–1,200 kg of feed per head annually; fatteners, 300 kg per cycle; and poultry such as layers, game fowls, and ducks, 45 kg, 18 kg, and 40 kg per head, respectively. These consumption rates indicate sustained demand for feed among local raisers. Since most feeds are currently sourced from outside the province, a local feed mill in Sablayan would reduce transportation costs, ensure feed availability, and promote the use of locally produced corn—enhancing both farmers' income and the feed industry's sustainability.

Table 5
Demand for Livestock and Poultry Feed Requirements

Type Of Animal (No. of Heads)						
Swine				Chicken		
Starter To Finisher	Fattener	Sow	Breeder Boar	Native	Broiler	Layer
2532	3979	1323	219	119913	37572	40052
200 (kg) x 2 Cycle	300 (kg) x 2 Cycle	1000 (kg)	1000 (kg)	5 (kg) x 8 Cycle	45 (kg)	12 (kg) x 3 cycle
1012800 (kg)	2387400 (kg)	1323000 (kg)	219000 (kg)	4796520 (kg)	1690740 (kg)	1441872 (kg)
Overall total: 12,871.33 metric tons 257, 426 sacks						

Table 5 presents the feed requirements for different types of livestock and poultry in the study area. The analysis includes swine—classified as starter to finisher, fattener, and breeder (sow and boar)—and chickens, including native, broiler, and layer types. Feed demand was calculated based on the number of animals and their respective feed consumption per growth cycle or year. Swine starters and finishers require 200 kg per head per cycle for two cycles, fatteners require 300 kg per head per cycle for two cycles, and breeders (sow and boar) consume 1,000 kg per head. For poultry, native chickens consume 12 kg per head over three cycles; broilers, 5 kg per head per cycle for eight cycles; and layers, 45 kg per hen annually. Based on the feed requirements for the province’s livestock and poultry presented in Table 5, the total annual feed demand in Occidental Mindoro is estimated at 12,871.33 metric tons, or 257,426 sacks per year, highlighting a significant supply that a locally established feed mill could address.

Table 6
Respondents’ Willingness to Purchase Locally Produced Feed Mill

Respondents: “Are you willing to patronize or sell locally produced feed mill?”	Livestock and Poultry Raisers		Feed Distributor, including Cooperatives	
	Yes	No	Yes	No
Abra De Ilog	7		1	
Paluan	6		0	
Mamburao	17		6	1
Sta Cruz	10		2	1
Sablayan	105		32	11
Calintaan	16		2	1
Rizal	13		2	
San Jose	160		28	8
Magsaysay	17		3	2
TOTAL	351		76	24

Supply Analysis - Table 6 shows the willingness of livestock and poultry raisers, as well as feed distributors (including cooperatives), to purchase or distribute locally produced feed from the proposed corn feed mill. Among the respondents, 351 livestock and poultry raisers indicated they were willing to patronize the local feed mill, while 76 expressed reluctance. Similarly, 24 feed distributors showed willingness to distribute the locally produced feed,

with a smaller number (noted per municipality) declining. The data indicate a strong overall support from both raisers and distributors, suggesting a positive market reception for the locally produced corn feed.

Market Share - The proposed business has a significant market opportunity, with a supply gap of 8,385.58 metric tons (166,651 sacks), representing 61% of total feed demand. This unmet demand offers the feed mill a chance to capture a substantial share of the local market by providing competitively priced, high-quality feeds for poultry and livestock farmers (Market Intelligence, 2026). The data indicates that the community's needs are currently underserved, positioning the feed mill to establish a strong presence in the province and secure a stable customer base from the start.

Table 7
Potential Market Share of the Proposed Corn Feed Mill during its Initial Operation

Description	Amount (in Metric Tons)	Equivalent (in Sacks)	Percentage Share	Market Share
Total Feed Demand in Occidental Mindoro	12,871.33	256,426 sacks	100%	6% of the 8,385
Current Feed Supply Distributor / Commercial Feed, Local Cooperative Feed, Hog / Poultry Feeds Vendors	4,485.75	89,775 sacks	39%	MT supply GAP will be the market share
Supply Gap / Potential Market for Local Feed Mill	8,385.58	166,651 sacks	61%	

Table 7 presents the potential market share for the proposed Corn Feed Mill during its initial operation in Occidental Mindoro. The total annual feed demand in the province is estimated at 12,871.33 metric tons, or 256,426 sacks. Currently, the existing supply is provided by a network of distributors, cooperatives, and hog and poultry vendors across the different municipalities, as shown in Tables 10 and 11. These suppliers collectively provide approximately 4,485.75 metric tons, or 89,775 sacks, meeting only 39% of the province's total demand. This indicates a significant supply gap that a locally established feed mill could address. However, the proposed business is expected to capture only 6% of the 8,385.58 MT supply gap, which accounts for 61% of total market demand. The current distributors primarily source feed from outside the province, often resulting in higher costs, inconsistent supply, and logistical challenges. By establishing a local feed mill, the supply chain could be shortened, delivery times reduced, and feed availability stabilized, benefiting both small- and large-scale livestock and poultry producers in Occidental Mindoro.

Regarding price competitiveness, price comparisons show that existing commercial feeds sold by distributors range from ₱2,180 to ₱3,250 per sack, depending on the brand. In contrast, the proposed feed mill is projected to sell feeds at approximately ₱1,400 per sack. This price difference is primarily attributed to the use of locally produced corn and reduced transportation costs. The lower price provides a competitive advantage for the proposed enterprise, making it an attractive option for farmers and feed distributors (Wang et al., 2022; Sachitra, 2016). The proposed business enterprise will produce nutritionally balanced feeds for swine and poultry using locally sourced yellow corn as the primary ingredient. Pricing will follow a cost-based strategy to maintain affordability while ensuring sustainability. Distribution will be centered in Sablayan, enabling efficient supply to nearby municipalities and major livestock production areas. Promotional activities will include farmer seminars, agricultural fairs, radio advertisements, and partnerships with cooperatives and local government units.

The results of marketing analysis demonstrate that Occidental Mindoro possesses the necessary conditions to support a local corn feed mill industry. The province has a strong corn supply, a growing livestock and poultry sector, and a significant gap between feed demand and supply (Sibuea et al., 2023). Survey findings reveal strong farmer support for local feed production and distributors' willingness to participate in the supply chain. Therefore, the proposed feed mill offers a competitive price advantage over existing commercial feeds sourced from outside the province. In terms of the financial feasibility of the proposed Corn Feed Mill, several key assumptions related to production capacity, pricing, and operational costs. The enterprise is projected to capture 6% of the feed demand-supply gap in Occidental Mindoro, equivalent to about 503 metric tons or 10,060 sacks of feed during its first year of operation. Production and sales are expected to increase by 5% annually, while the selling price of feeds will start at ₱1,400 per sack with an estimated annual adjustment of 3.13% to reflect inflation. Costs of raw

materials, overhead expenses, salaries, and other operational expenditures are also projected to increase gradually to account for inflation and wage adjustments. Depreciation of equipment will be computed using the straight-line method, while statutory allocations and cooperative funds will be distributed in accordance with cooperative financial policies.

The total capital requirement for establishing the feed mill is estimated at **₱14,026,156.48**, which covers administrative expenses, raw materials, equipment, operating costs, and facility renovation. A significant portion of the budget is allocated to feed ingredients, such as yellow corn, and other materials necessary for feed production. To finance the project, the cooperative will combine internal capital from member share contributions with external funding assistance. Part of the funding will be sourced from government support programs, including assistance from the **Department of Agriculture's** Agribusiness and Marketing Assistance Division (AMAD), as well as potential financing from other government agencies and development institutions.

Demand and Supply Analysis - The proposed Corn Feed Mill in Occidental Mindoro has strong market potential, driven by the province’s substantial livestock and poultry population. Swine consumption ranges from 45 kg per starter pig to 1,000 kg per breeder sow annually, while poultry consumption ranges from 5 kg per broiler per cycle to 45 kg per layer per year. Based on the number of animals in the province, the total annual feed demand is estimated at 12,871.33 metric tons (256,426 sacks). As such, according to Table 12: Potential Market Share of the Proposed Corn Feed Mill during Its Initial Operation, local distributors currently supply only 4,485.75 metric tons (89,775 sacks), meeting 39% of the total demand and leaving a supply gap of 8,385.58 metric tons (166,651 sacks), or 61% of the market. Survey results reveal strong support from 351 livestock and poultry raisers and 76 feed distributors, indicating a ready market for locally produced feeds. The province’s abundant corn production provides a sustainable supply of raw materials, which can help lower production costs and offer farmers a stable market. This unmet demand represents a significant opportunity for the feed mill to capture a substantial share of the local market, establish a strong presence, and secure a reliable customer base.

Marketing Strategies - To ensure competitive positioning and customer loyalty, the proposed Corn Feed Mill will adopt a combination of product, price, place, and promotion (4 Ps) strategies:

Product. The feed mill will produce various feed formulations tailored for broilers, layers, hogs, and ruminants. Emphasis will be placed on quality, nutritional balance, and adherence to Bureau of Animal Industry (BAI) standards. The proposed Corn Feed Mill in Occidental Mindoro will primarily use locally sourced yellow corn as its major raw material, comprising about 50–60% of the total feed formulation. Corn serves as the main energy source in both hog and poultry feeds due to its high carbohydrate content, good palatability, and digestibility. To achieve balanced nutrition for optimal growth, the feed formulation will also include several supplementary ingredients that provide protein, vitamins, minerals, and essential nutrients. These components can be sourced from local suppliers, agricultural by-products, and commercial feed additives (Pesti & Choct, 2023).

Table 8
Comparison of Proposed Local Corn Feed Mill Price with Imported Feed based on Price

Feed Type	Price per 50 kg Sack (₱)	Notes
Proposed Local Corn Feed Mill	1,400	Cost-based pricing; 35% lower than imported feeds
Imported Feed	2,160	Higher due to transportation and raw material costs

Table 8 illustrates that the proposed business will implement a cost-based pricing strategy, selling its 50 kg feed sacks at **₱1,400**, which is **35% lower than the ₱2,160** charged for imported feeds, taking advantage of reduced transportation and raw material costs.

Place / Distribution. The distribution strategy will primarily focus on the province of Occidental Mindoro, with Sablayan serving as the central, most strategic location to efficiently meet province-wide feed demand. From this central hub, the operation can ensure accessible delivery to surrounding municipalities. In the long term, distribution will gradually expand to other parts of the MIMAROPA Region. The products will be marketed and sold both directly to farmers and through accredited distributors and agri-supply stores across the province.

Promotion. Awareness campaigns will include participation in agricultural fairs, direct farmer seminars, radio advertisements, and partnerships with local government units and cooperatives.

Product Description - The proposed feed mill will produce formulated animal feeds for poultry and livestock, specifically broilers, layers, hogs, and ruminants. The main product categories will include: Broiler Starter, Grower, and Finisher Feeds; Layer Mash and Pellets; Swine Starter, Grower, and Finisher Feeds; and Ruminant Feeds (for cattle and goats). All formulations will be based on scientifically established nutritional standards using yellow corn as the primary energy source. Other ingredients, such as soybean meal, rice bran, copra meal, fishmeal, salt, and vitamin-mineral premixes, will be blended to ensure complete and balanced nutrition. Each feed type will undergo quality control testing to ensure compliance with the Bureau of Animal Industry (BAI) and Department of Agriculture (DA) standards for feed manufacturing.

Production Process

The production process of the Corn Feed Mill involves several systematic stages designed to ensure the quality and uniformity of the finished products. The general process flow is as follows: Corn Procurement and Delivery – Locally produced yellow corn is purchased directly from farmers and delivered to the feed mill. Receiving and Cleaning – Raw corn is weighed, inspected for moisture and foreign materials, and passed through a cleaning machine to remove impurities. Grinding/Milling – Cleaned corn is crushed into fine particles using a hammer mill to achieve the desired particle size for mixing. Batching and Mixing – Ground corn is combined with other ingredients (soybean meal, rice bran, copra meal, etc.) in precise proportions using a mixer to create a homogenous feed mixture. Pelletizing (if applicable) – The mixed feed is then processed through a pellet mill to form compact pellets suitable for livestock consumption. Cooling and Screening – Hot pellets are cooled using a cooler and screened to remove fines or broken pellets. Bagging and Weighing – The finished feed are packed in 50-kg polypropylene bags using an automatic bagging and weighing machine. Storage and Dispatch – The bagged feeds are stored in a warehouse under controlled conditions and distributed to

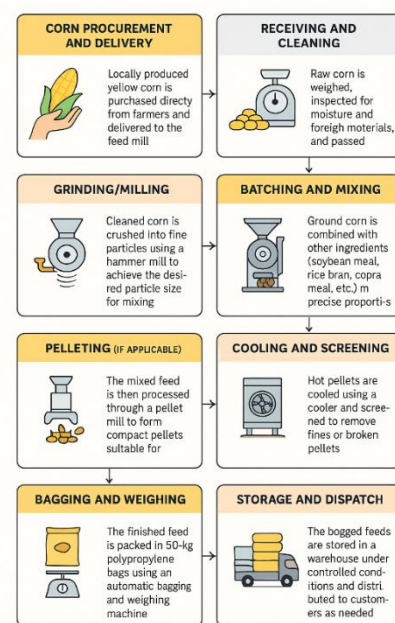


Exhibit 1. Production Process Cycle

Project Location - The proposed feed mill processing facility will be established in Brgy. Ligaya, Sablayan, Occidental Mindoro, on a site covering approximately 2,000 square meters. The area is designated as industrial land, making it ideal for feed mill operations. It is not near residential areas, as the location is currently sparsely populated, minimizing potential community disturbances. The site provides direct access to the national road, facilitating efficient transport of raw materials to the facility and distribution of finished products to various municipalities. Being centrally located in the municipality of Sablayan, it offers a strategic advantage in serving both northern and southern municipalities of Occidental Mindoro, reducing overall logistics costs. Additional advantages of the location include an existing building suitable for feed mill operations and storage, minimizing construction costs (Williams & Rosentrater, 2004); ample warehouse capacity to accommodate approximately 5,000 sacks of feed, ensuring efficient inventory management; access to electricity and water supply to support continuous operations; potential for future expansion due to the property’s size and industrial zoning; and a low risk of environmental or social conflict, as the facility is situated in an underpopulated area unlikely to disturb nearby communities. Overall, the proposed location offers logistical efficiency, operational convenience, and scalability, making it highly suitable for establishing the feed mill processing facility.

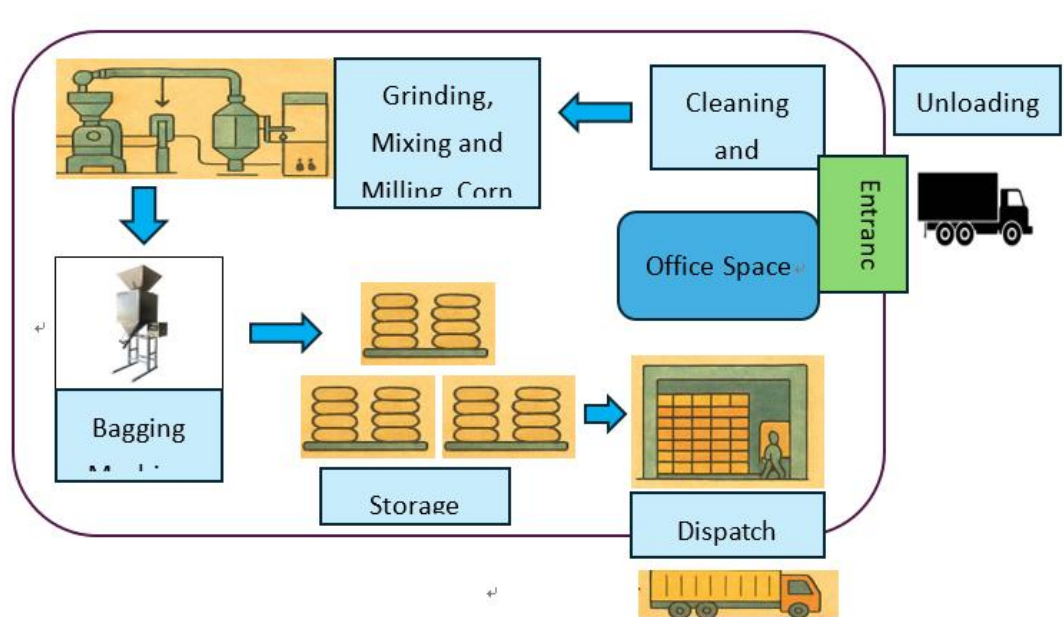


Exhibit 2. Layout of the Production Area of the Proposed Business

Exhibit 2 illustrates the feed mill production layout, designed to ensure a smooth and efficient linear workflow in strict compliance with standard corn feed mill infrastructure. The process begins with the procurement and delivery of locally produced corn directly from farmers to the receiving area, where it is weighed, inspected for moisture and impurities, and cleaned to maintain quality. The cleaned corn is then transferred to the grinding and milling area, where it is crushed into fine particles suitable for feed production. These ground particles are accurately measured and blended with other ingredients, including soybean meal, rice bran, and copra meal, in the batching and mixing area to produce a homogeneous feed mixture. The mixture is optionally processed through a pellet mill, cooled, and screened to remove fines or broken pellets. The finished feed is automatically bagged and weighed in 50-kg bags, with up to 5,000 bags stored in a dedicated stock area under controlled conditions to preserve quality. From this storage area, the feed is systematically dispatched to customers, ensuring a seamless flow of materials from raw inputs to finished products while minimizing handling, preventing contamination, and maximizing operational efficiency.

Business Organization - The proposed business will operate as a cooperative under the name of Golden Harvest Corn Feed Mill Agriculture Cooperative (GHCFA Co). The proponent will initially organize the group, aiming to recruit approximately 200 members, each contributing a minimum capital share to support the project's startup costs. As a member-owned and member-managed enterprise, the cooperative is established to serve corn and livestock farmers by addressing service gaps in the feed industry. This cooperative structure ensures a stable market for its products, fosters equitable profit sharing, and encourages active participation of members in both decision-making and operational management. The proposed business will require an initial operating capital of ₱11,816,156.48 to cover production setup, facility improvements, raw materials, labor, and working capital. However, since the business operates as a cooperative, there is a strong possibility that the estimated ₱11,000,000 allocated for renovation, operating expenses, machinery and equipment, and raw material financing may be requested as financial assistance from various national government agencies that support the advancement of the agriculture sector. This aligns with the Philippine government's priority thrusts under the Sustainable Development Goal (SDG) 2040, which emphasize agricultural modernization, livelihood enhancement, and rural development (The Sustainable Development Goals in the Philippines).

Registration with the Cooperative Development Authority (CDA) grants the enterprise legal recognition, access to technical and financial assistance, capacity-building programs, and potential tax incentives, thereby enhancing operational efficiency and long-term sustainability. Overall, the cooperative model promotes inclusivity, economic empowerment, and shared prosperity—positioning the enterprise as both a profitable and community-

oriented agribusiness contributing to national agricultural growth and sustainability (CDA, 2025).

Nature of Business - The proposed business, Golden Harvest Corn Feed Mill Agriculture Cooperative (GHCFM ACo), is a corn feed mill cooperative established to produce and distribute high-quality livestock feed, primarily made from locally sourced yellow corn. The cooperative aims to support corn and livestock farmers by providing affordable, accessible, and nutritionally balanced feed products while ensuring a stable market for members' corn produce. In addition to feed production, the cooperative will be involved in the procurement of raw materials from member-farmers, storage and inventory management, marketing and distribution of feeds to local livestock and poultry raisers, and provision of technical assistance and advisory services on proper feed usage and animal nutrition. The cooperative will operate under democratic governance, where members participate in decision-making and share in the profits, reinforcing community development, sustainable agriculture practices, and long-term economic growth for its stakeholders.

Project Cost - To start the proposed business operation, the initial capital is being identified below.

Table 9

Total Project Cost

Items	Descriptions	Cost	Total Cost
Administrative Expense	Salaries and Wages	620,880.00	
	Employee Benefits and Premiums	134,066.48	
	Permits and Licenses	30,210.00	785,156.48
Direct Materials	Yellow Corn (Maize)	4,800,000.00	
	Soybean Meal	1,200,000.00	
	Rice Bran (Darak)	420,000.00	
	Copra Meal / Coconut Cake	360,000.00	
	Fish Meal	800,000.00	
	Molasses	105,000.00	
	Limestone / DCP	100,000.00	
	Salt	25,000.00	
	Vitamin-Mineral Premix	100,000.00	
	Feed Additives (Lysine, Enzymes, etc.)	50,000.00	7,960,000.00
Pre-Operating Expenses	Feed Processing Equipment and Machinery	2,050,000.00	
	Utilities and Auxiliary Equipment	575,000.00	
	Packaging and Storage Materials	285,000.00	
	Safety and Maintenance Tools	60,000.00	
	Material Handling Equipment	1,250,000.00	4,220,000.00
Furniture and Fixture	Office Furniture and Fixture	230,000.00	230,000.00
	Operating Expenses		
Renovation Cost	Office Supplies and Materials	24,000.00	
	Utilities (Electricity, Water, Internet)	60,000.00	
	Communication Expenses	18,000.00	
	Repairs and Maintenance (Office Equipment)	30,000.00	
	Transportation and Travel Allowance	60,000.00	
	Insurance	10,000.00	
	Warehouse Rent	60,000.00	
	Professional Fees	25,000.00	
	Representation and Meetings	24,000.00	311,000.00
	Civil Works (Building Repair & Structural Improvements)	150,000.00	
	Electrical Works	50,000.00	
	Plumbing Works	20,000.00	
	Roofing and Insulation	50,000.00	
Flooring Improvement	150,000.00		
Partitioning / Office Renovation	50,000.00		
Painting and Finishing	50,000.00	520,000.00	
TOTAL PROJECT COST			14,026,156.48

Table 9 presents the total project cost of ₱14,026,156.48, representing the overall capital requirement to establish and operate the proposed Corn Feed Mill. This amount covers all essential expenditures necessary to commence operations efficiently and sustainably. The major cost component is Direct Materials, amounting to ₱7,960,000.00, which constitutes the largest share of the total cost and includes the procurement of key raw

materials such as corn, soybean meal, rice bran, and other essential feed ingredients required for production. Pre-operating expenses totaling ₱4,220,000.00 cover the acquisition of machinery and equipment, the installation of utilities, and the installation of packaging and handling facilities needed to ensure efficient feed-processing operations. Administrative expenses totaling ₱785,156.48 include salaries and benefits for management and staff, as well as permit and license costs. Additional allocations consist of Operating expenses of ₱311,000.00 for utilities, office supplies, transportation, and insurance; Furniture and fixtures worth ₱230,000.00 for the office setup; and Renovation costs of ₱520,000.00 for necessary structural and facility improvements. Notably, ₱11,000,000.00 of the total project cost, primarily covering operating costs for machinery and equipment as well as raw materials, will be sourced from a grant under the Department of Agriculture's Agribusiness and Marketing Assistance Division (AMAD) Program. This financial assistance aligns with the government's Ambisyon Natin 2040 and the Sustainable Development Goals, particularly SDG 2: Zero Hunger, by supporting the modernization of agricultural productivity, strengthening the feed supply chain, and promoting sustainable and inclusive agri-based enterprise development (AmBisyon Natin 2040, n.d.).

Source of Financing - The source of financing will be the cooperative members' paid-up capital, with 200 prospective members contributing not less than 2,500 shares each at a ₱100 par value per share, for a total of ₱250,000.00. In addition, there will be a subscribed share capital of at least 7,500 shares with the same par value, supported by the cooperative's Capital Build-Up Program as stated in its By-Laws. To further strengthen the project's financial capability, the cooperative will seek ₱13,000,000 in funding assistance from various external sources, including grants, subsidies, and other forms of financial support from National Government Agencies (NGAs) and their programs. Key potential sources include the Philippine Rural Development Project (PRDP) under the Department of Agriculture (DA), the Department of Trade and Industry (DTI) for enterprise development and MSME support, the Department of Agrarian Reform (DAR) for cooperative development programs, the Department of Science and Technology (DOST) for technology transfer and process innovation, and the Land Bank of the Philippines or Development Bank of the Philippines for low-interest loans and capital financing. Additional assistance may be accessed through the DA's Agricultural Competitiveness Enhancement Fund (ACEF), the Bureau of Small and Medium Enterprise Development (BSMED), and other DA-attached agencies. Given that there is currently no corn feed mill in Occidental Mindoro, this project strongly supports the government's initiatives in agricultural development, value addition, and rural industrialization. Through these NGA interventions, the cooperative can secure technical assistance, capacity-building programs, market access facilitation, and financial resources, ensuring the successful establishment of the corn feed mill and long-term benefits for local corn farmers and livestock producers.

Furthermore, the cooperative is well-positioned to qualify for grants and financial assistance from programs offered by the Philippine Center for Postharvest Development and Mechanization (PhilMech), the DA Agribusiness and Marketing Assistance Division (AMAD), and other related agencies. These programs aim to enhance agricultural productivity, sustainability, and food sufficiency, aligning perfectly with the objectives of the proposed Corn Feed Mill. With strong institutional support, the project has a high potential for funding approval and long-term success in contributing to the province's agricultural growth.

Basic Financial Assumption - The proposed cooperative is expected to capture 6% of the provincial feed demand-supply gap in the first year, equivalent to 503 metric tons (10,060 sacks) of feed. Production and sales are projected to increase by 5% annually. The selling price will be set at ₱1,400 in the first year, with an annual increase of at least 3.13%, based on the average inflation rate from 2019 to 2023, to anticipate possible increases in the cost of raw materials and other expenses. The costs of raw materials and overhead expenses are projected to rise in line with the average inflation rate of 3.13%. Depreciation expense is computed using a straight-line method with an estimated useful life of 5-10 years. Salaries, 13th-month pay, and mandatory government contributions or premiums will increase by 2% annually. Promotional expenses, office supplies, utilities, repair, and maintenance will increase by 2% annually. An annual communication and internet allowance of ₱18,000 will be provided. The rental rate will be adjusted upward by 5% at three-year intervals.

The production of feeds for poultry and livestock will start in the last quarter of 2026. The program will purchase the raw materials needed in the 1st month of the 2nd quarter of 2026. For the first five (5) years of operation, 50% of the net surplus will be allocated to the Reserve Fund to ensure financial stability and sustainability. Beginning in the sixth (6th) year of operation, this allocation will be reduced to 10%. The Cooperative Education and Training Fund (CETF) will be set at 10% of the net surplus, with 50% allocated for local use and the remaining 50% remitted to the chosen Federation or Union. The Optional Fund will be set at 7%, and the Community Development Fund (CDF) will receive 3% of the net surplus. The undistributed net surplus, after allocation to the statutory reserve, will be divided equally: 50% will be allocated to Interest on Share Capital (ISC) for distribution to members, and the remaining 50% will be designated as Patronage Refund (PR) to be distributed to member patrons.

Financial Projections

Table 10
Projected Five-Year Demand and Sales

Year	Annual Volume of Production (MT)	Annual volume per sack (50 kg per sack)	Price per sacks	Annual Sales
2027	503	10,060	1,400.00	14,084,000.00
2028	518	10,362	1,445.00	14,972,801.00
2029	534	10,673	1,490.00	15,902,254.46
2030	550	10,993	1,535.00	16,873,999.61
2031	566	11,323	1,585.00	17,946,350.53

Table 10 shows the five-year demand and sales projection for the proposed Corn Feed Mill, based on a Demand-Supply Gap Analysis with an estimated 6% market share. Production, sales, and prices are projected to grow steadily from 2027 to 2031. In 2027, production is estimated at 503 MT (10,060 sacks), generating ₱14,084,000 in sales at ₱1,400 per sack. By 2028, production rises to 518 MT (10,362 sacks) with sales of ₱14,972,801 at ₱1,445 per sack. This upward trend continues, reaching 534 MT (10,673 sacks) and ₱15,902,254 in 2029; 550 MT (10,993 sacks) and ₱16,873,999 in 2030; and 566 MT (11,323 sacks) and ₱17,946,351 in 2031, at ₱1,585 per sack. Overall, the projections reflect consistent annual growth in production and revenue, highlighting the Corn Feed Mill’s strong market potential, profitability, and long-term sustainability. Likewise, the projected financial results of the Corn Feed Mill indicate a financially viable and sustainable operation, with a first-year net surplus of ₱2,912,157.81, demonstrating its capacity to cover operating costs while generating positive returns. From this surplus, ₱2,038,510.46 is allocated to statutory reserves in compliance with cooperative requirements, including the General Reserve Fund (50%, ₱1,456,078.90), Education and Training Fund (10%, ₱291,215.78), Optional Fund (7%, ₱203,851.05), and Community Development Fund (3%, ₱87,364.73). The Education and Training Fund is divided equally, with ₱145,607.89 remitted to the federation and ₱145,607.89 retained locally to support training, education, and capacity-building for officers, staff, and members. The remaining net surplus is available to accrue interest on share capital and to fund patronage refunds, ensuring that members directly benefit from the cooperative’s operations. Overall, the Corn Feed Mill demonstrates operational efficiency, regulatory compliance, and member-centered growth, generating surpluses that fund statutory reserves and development programs, ensuring long-term financial sustainability and continued support for both members and the community. Overall, the results indicate that establishing a corn feed mill in Sablayan is both market feasible and economically promising, with the potential to improve feed accessibility, strengthen agricultural value chains, and support the sustainable growth of the livestock and poultry industries in Occidental Mindoro.

Financial Ratios and Analyses

The *Gross Profit Ratio (GPR)* measures a business's efficiency in generating profit from its sales after deducting the cost of goods sold (COGS). It indicates the portion of each peso earned from sales that is retained as gross profit. A higher GPR reflects better cost control and improved profitability. The Gross Profit Ratio of the proposed business shows a consistent increase from 39% in 2027 to 46% in 2031, indicating improved efficiency and profitability. This upward trend reflects effective cost management, optimized production, and growing market

acceptance. As operations stabilize and economies of scale are achieved, the business gains higher returns from sales each year. Overall, the rising Gross Profit Ratio indicates a strong, positive financial outlook, confirming that the corn feed mill operation is becoming more efficient, sustainable, and profitable over time. The results of the gross profit ratio are supported by established financial management literature. Horngren et al. (2013), in *Introduction to Management Accounting*, explain that a higher gross profit ratio indicates more efficient control of production costs relative to sales, suggesting improved profitability and sound cost management. Similarly, Brigham and Ehrhardt (2017), in *Financial Management: Theory & Practice*, assert that sustained improvements in the gross profit margin indicate enhanced operational efficiency, effective pricing strategies, and positive market acceptance, which are essential indicators of a firm's long-term financial sustainability.

The Net Profit Ratio of the proposed business shows a consistent increase from 21% in 2027 to 34% in 2031, indicating strong profitability and financial growth. In the first year of operation (2027), the business will achieve a 21% net profit, reflecting a solid start and a full year of productive operation. This positive outcome demonstrates that the enterprise efficiently managed its initial costs and established a stable revenue stream early on. In the succeeding years, the net profit ratio rose from 27% to 34%, indicating improved cost efficiency, higher sales volume, and sustained operational growth. This upward trend signifies sound financial health and effective management performance. Overall, the increasing profitability not only ensures the business's stability but also encourages investor confidence and member participation, leading to the continuous expansion of capitalization and business operations. The strong financial outlook confirms that the proposed corn feed mill is on a sustainable path toward long-term success and growth. The net profit ratio results are supported by relevant financial management literature. Horngren et al. (2013) explain that the net profit ratio measures a firm's overall profitability after accounting for all expenses, reflecting its ability to convert sales into net income; an increasing ratio indicates effective cost control, revenue growth, and operational efficiency. Likewise, Brigham and Ehrhardt (2017) and Handayani & Winarningsih (2020) emphasize that rising net profit margins over time signify improving financial health, sustainable growth, and sound management practices, thereby reinforcing the positive implications of the net profit ratio results.

The ROI shows a strong upward trend from 21% in 2027 to 43% in 2031, indicating efficient use of invested capital and increasing profitability. In the first year, the 21% ROI reflects a solid start and effective utilization of the full-year operation. The continuous increase in the following years demonstrates improved cost efficiency, higher sales, and sustainable growth. Overall, the rising ROI signals strong financial health and a positive outlook, encouraging investors and cooperative members to increase participation and supporting the business's continued expansion. The return on investment (ROI) results are supported by established financial management literature. Horngren et al. (2013) explain that profitability measures, such as the net profit ratio, reflect a firm's ability to generate net income from its sales through effective cost management, revenue growth, and operational efficiency, all of which directly influence the return generated on invested capital. Similarly, Brigham and Ehrhardt (2017) and Setyopurnomo et al. (2025) emphasize that sustained increases in profitability indicators, including net profit margins, are associated with improved financial health, efficient resource utilization, and sound management practices, all of which contribute to a higher and more favorable return on investment.

Socio-Economic Aspect - The establishment of the Golden Harvest Corn Feed Mill Agriculture Cooperative (GHCFM ACo) in Sablayan, Occidental Mindoro, is expected to generate broad socio-economic benefits. Cooperative members gain financial returns and decision-making opportunities, while employees secure stable jobs and skills development. Local farmers benefit from guaranteed markets and fair prices, and the community experiences increased economic activity and rural employment. Consumers, such as hog and poultry raisers, have access to affordable, high-quality feed, improving productivity. Overall, the cooperative promotes sustainable agriculture, inclusive growth, and strengthened local food systems (Galano, 2025).

SWOT and Potential Problem Analysis - The Golden Harvest Corn Feed Mill Agriculture Cooperative (GHCFM ACo) leverages key strengths, including being the first feed mill in Occidental Mindoro, using locally sourced corn, operating under a cooperative structure, receiving government support, and offering competitive

pricing. Weaknesses include limited startup capital, technical experience, reliance on member corn supply, and unestablished marketing channels. Opportunities arise from growing feed demand, government programs, market expansion, value-added opportunities for farmers, and the promotion of sustainable agriculture. Threats include price fluctuations, competition, climate risks, regulatory changes, and livestock/poultry disease outbreaks (Bilotto et al., 2024).

Potential Problems and Mitigation - The proposed Golden Harvest Corn Feed Mill Agriculture Cooperative (GHCFM ACo) may encounter several operational challenges. Limited capital could delay equipment purchases and startup activities. However, this risk can be mitigated by securing funding from national government agencies, banks, and member contributions, and by phasing project implementation. Technical gaps that may affect feed quality can be addressed through staff training, hiring experienced management, and collaborating with agencies such as DOST and PhilMech. Fluctuations in corn supply, which could increase costs, can be managed via long-term agreements with farmers, maintaining inventory buffers, and careful crop planning (Sulillari, 2023). Market competition may reduce market share, which can be countered through competitive pricing, emphasizing locally produced high-quality feed, and strengthening cooperative branding. Operational inefficiencies that lead to higher costs and waste can be minimized by implementing standard operating procedures, enforcing strict quality control, and pilot-testing production processes (Gerpott & Berends, 2022). Climate risks that affect raw material availability can be mitigated by diversifying sourcing, investing in adequate storage facilities, and obtaining crop insurance. Regulatory changes may cause compliance delays or additional costs, which can be mitigated by maintaining active liaison with the CDA, DA, and LGUs and by monitoring relevant regulations (Sahoo et al., 2026). Finally, low member participation, which could weaken operations, can be improved by holding regular meetings, offering training programs, providing incentives, ensuring transparency, and adhering to democratic governance. By implementing these mitigation measures, GHCFM ACo aims to ensure fair pricing, transparency, high-quality feed production, environmental sustainability, community contribution, and full compliance with laws, thereby fostering trust and social responsibility (Burke, 2011).

4. Conclusions

The establishment of the Golden Harvest Corn Feed Mill Agriculture Cooperative in Sablayan, Occidental Mindoro, is feasible and promising due to the following reasons: (1) First-mover advantage, as it will be the first corn feed mill in the province, allowing early brand recognition and market capture. (2) The proposed business has a stable raw material supply, uses locally sourced yellow corn, supporting a reliable production process. (3) As a cooperative type of business, it benefits from strong linkages with the government, gaining access to programs and financing from national agencies that support rural industrialization and cooperative development. (4) Market demand is strong and growing for livestock and poultry feeds locally and regionally. (5) In terms of profitability, the financial projections indicate sustainable revenue and returns for members. (6) The socio-economic impact demonstrates strong support for local farmers, generates employment, stimulates the community economy, and enhances the local livestock sector.

Recommendations - Based on the conclusions presented in this study, the proponent has arrived at the following: (1) The proponents will move forward with establishing the Golden Harvest Corn Feed Mill Agriculture Cooperative (GHCFM ACo) in Sablayan, Occidental Mindoro, or this feasibility study may be adopted by an existing registered cooperative in the vicinity, recognizing the strong market potential, socio-economic benefits, and strategic advantage of operating the first local feed mill. (2) The Manager, with the approval of the Board of Directors, will secure additional funding and technical support from government agencies and financial institutions such as the Department of Agriculture, PhilMech, AMAD, PRDP, and DOST to address initial capital requirements and operational challenges. (3) The management may ensure capacity and capability building through staff training, quality control systems, and efficient production workflows to ensure high-quality feed and operational efficiency. (4) The management may establish long-term agreements with local corn farmers to stabilize raw material supply and promote sustainable agricultural practices. (5) The management and cooperative officers may promote cooperative membership engagement, transparency, and democratic decision-making to strengthen ownership,

accountability, and commitment. (6) The Management, together with the Board of Directors, may continuously monitor market trends, competition, regulatory developments, and climate-related risks to adjust strategies and ensure the long-term sustainability of the business. (7) The Board of Directors and the Management may mitigate challenges such as limited capital, technical capacity, supply fluctuations, and competition through training, partnerships, and operational planning. (8) The Board of Directors and the Management may ensure fair practices, high-quality feed, and environmentally responsible production for sustainable and ethical operations.

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A feasibility study on dried Indian mango production business in San Jose, Occidental Mindoro

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Abstract

This feasibility study examines the potential for launching a small-scale dried Indian mango business in San Jose, Occidental Mindoro. The project is designed to provide a healthy, locally sourced snack while supporting mango farmers, reducing post-harvest losses, and creating income opportunities. The study reviews market demand, startup and operating costs, production feasibility, and socio-economic impact. San Jose, with its population of over 150,000 and strong transport connections, offers an ideal setting for the venture. Survey results from OMECO and LBP employees show that 99% are willing to buy the product, most preferring two to three packs, and more than half are ready to pay above ₱40. Based on a conservative 10% market share, Production is planned at about 200 pouches per day using food-grade dehydrators. The initial investment is ₱312,711.38, with two staff members employed under regional wage standards. Financial projections indicate 10% annual output growth, periodic price adjustments, and a shift from 3% OPT to VAT registration by the fourth year. Profitability is strong, with gross profit ratios ranging from 54% to 56% and net margins rising from 11% to 25% over five years. Overall, the study presents a practical, community-oriented business model that leverages local resources, meets consumer demand, and contributes to rural development in Occidental Mindoro.

Keywords: dried Indian mango, small-scale agribusiness, local value addition, locally sourced snack, production feasibility

A feasibility study on dried Indian mango production business in San Jose, Occidental Mindoro

1. Introduction

San Jose, Occidental Mindoro, is recognized as a thriving agricultural municipality with fertile lands and diverse crop production (PhilAtlas, 2020). Mango is among its most abundant fruits, recognized as a staple in Filipino households and celebrated as a symbol of tropical abundance. Local trade fairs and community reports consistently highlight mango as one of the area's standout products (Philippine Information Agency, 2025; CARD MRI, 2025). The Indian mango variety, locally grown and widely appreciated for its tangy-sweet flavor, firm texture, and high fiber content, is especially common in backyard farms and small orchards throughout the province. Its widespread presence reflects both the richness of local agriculture and the cultural importance of mangoes in the community.

Despite its popularity, a significant portion of mango harvests in San Jose goes to waste during peak seasons due to limited postharvest infrastructure, preservation methods, and market saturation (CARD MRI, 2025). According to the Philippine Mango Industry Roadmap 2021–2025, mango is still one of the country's top crops, with Guimaras, Pangasinan, and Zambales leading in production. According to the Department of Agriculture (2021), additional mango processing and value-added projects are needed to reduce waste and help farmers earn more. Antolin and Malanon (2024) also note that postharvest losses are often due to poor handling and limited facilities. These problems are also seen in Occidental Mindoro.

Dried mango is a popular export from the Philippines, valued for its long shelf life, convenience, and natural sweetness. However, most production happens in larger provinces and is led by big companies. Small producers in Occidental Mindoro have not yet fully capitalized on this market. The Training Manual on Mango Production in the Philippines stresses the importance of proper harvesting, handling, and drying to maintain fruit quality (CropLife Philippines, n.d.). Improper harvesting and transport often bruise mangoes, reducing their quality and market appeal. This shows the need for local value-added solutions, such as drying (Galvan, 2020).

More Filipinos are becoming health-conscious, which has increased demand for natural and minimally processed foods (Department of Health [DOH], 2024; Statista, 2025). Mangoes are rich in vitamins A and C, antioxidants, and fiber, so dried mango is a healthier choice than sugary or salty snacks (Food and Nutrition Research Institute [FNRI], 2024). This shift is clear in schools, offices, and homes throughout Occidental Mindoro. Dried mango production also has a big impact on local communities. By purchasing mangoes directly from farmers in San Jose and nearby towns such as Rizal, Magsaysay, and Calintaan, businesses can establish a steady supply chain and support local farmers. The MangoTayo! study from Davao del Sur State College (DSSC) highlights that, despite a decline in national mango production from 2000 to 2020, there is a growing interest in sustainable farming that includes small farmers in the value chain. These approaches help rural communities grow and benefit from agriculture-based businesses.

San Jose's climate, with its clear wet and dry seasons, is well-suited for growing mangoes. By using modern drying technology and clean processing methods, the area can become a local center for dried mango production. This effort also supports national goals to grow agriculture businesses, cut food waste, and help rural areas develop. This feasibility study explores the technical, financial, and market viability of establishing a dried Indian mango enterprise in San Jose. It aims to provide a roadmap for transforming an abundant local resource into a high-value product that meets modern consumer demands while uplifting the local economy and promoting healthier lifestyles among Mindoreños.

Objectives of the Study - The study aims to assess the feasibility and market potential of producing and selling

dried Indian mango with a twist in San Jose, Occidental Mindoro, by examining consumer acceptance and purchase intent, evaluating market demand in San Jose and nearby areas, and calculating the startup capital and operational costs required for the enterprise. It further seeks to identify the most suitable location for production and distribution while promoting sustainability in local mango farming through reduced postharvest waste. Finally, the study intends to evaluate the socio-economic benefits of the enterprise, including job creation and income opportunities for farmers, thereby contributing to community development and rural economic growth.

Significance of the Study - This feasibility study on dried Indian mango production in San Jose, Occidental Mindoro, is significant because it provides practical insights and benefits for consumers, farmers, small enterprises, and the local government. It introduces a healthy, locally produced snack that meets rising demand for natural foods, reduces postharvest waste, stabilizes farmer income, and supports community-based agribusiness opportunities. The findings also inform rural enterprise development and promote the use of local materials and traditional farming skills, strengthening community pride and sustainability. Finally, the study offers a foundation for academic and industry research on product development, supply chains, and consumer preferences, contributing to more resilient rural food systems.

Scope and Delimitation of the Study - This study evaluates the feasibility of producing and marketing dried Indian mango with a twist in San Jose, Occidental Mindoro. It covers key areas, including market demand, production techniques, financial viability, and socio-economic impact. The research aims to determine whether a small-scale dried mango enterprise can thrive in the local setting by utilizing surplus mango harvests and introducing a value-added product to the community. The study gathered information through structured surveys with local mango growers and potential customers. It also considers potential buyers, including school and office canteens, pasalubong centers, and local stores. Although the main focus is on San Jose, the research also uses information from nearby towns, such as Rizal, Magsaysay, and Calintaan, to gain a deeper understanding of how mangoes are grown and sold in the region. This study focuses on simple mango-drying methods suitable for small businesses, rather than for large factories or export processes. The financial review examines the costs of starting and running the business, as well as the expected profits in the first few years. Marketing plans are based on how local people purchase products and the methods used to sell goods in the area. The projections and analyses in this study cover five years from 2026 to 2030, with 2025 serving as the baseline year for computations. This time frame was chosen to give a realistic picture of both short-term viability and long-term sustainability. This research does not cover large commercial production, international markets, or advanced food preservation methods. It mentions outside factors, such as changes in climate, national trade rules, and long-term farming policies, but does not study them in detail.

Sources of data - This study utilized both primary and secondary data to assess the feasibility of producing dried Indian mango with a twist in San Jose, Occidental Mindoro. Primary data were obtained through structured surveys, which provided firsthand insights into mango production capacity and consumer preferences. Respondents included local mango farmers from Barangays Camburay, Central, San Isidro, and Mapaya, as well as employees of LBP and OMECO. Secondary data were gathered from published materials, including agricultural manuals, feasibility studies, academic journals, and government reports. These sources supported the technical and financial analysis of mango processing, including production methods, cost requirements, and agribusiness market trends.

Ethical Considerations - The researcher adhered to ethical standards throughout this feasibility study, handling data responsibly and respecting all individuals involved. Information from surveys was used solely for academic purposes and aligned with the study's objectives. Participation was voluntary, and respondents were aware that they could decline at any time without any negative consequences. Before data collection, informed consent was obtained from individuals involved, including mango growers and institutional employees. The researcher ensured that all responses were kept confidential and securely stored, with no personal data shared beyond the scope of the research. To maintain academic integrity, all secondary sources, including published studies, reference materials, and government reports, were properly cited in accordance with APA 7th edition

guidelines. The researcher also adhered to the Data Privacy Act of 2012 (RA 10173), ensuring that the study was transparent, respectful, and accountable at every stage.

2. Methodology

This study employed a descriptive quantitative research design to assess the practicality and market potential of producing dried Indian mango with a twist in San Jose, Occidental Mindoro. Data were collected exclusively through structured survey questionnaires targeting two key groups: local mango growers and selected employees of the Land Bank of the Philippines (LBP) and Occidental Mindoro Electric Cooperative (OMECO), who represent the potential consumer market.

Convenience sampling was used to select participants who were easily accessible and had relevant experience or purchasing habits. Mango growers from the barangays of Camburay, Central, San Isidro, and Mapaya in San Jose, Occidental Mindoro (see Table 2) were included to ensure that supply-side information reflected actual production practices. Employees of LBP and OMECO were also chosen because they were easily accessible and familiar with local food products, providing practical insights into consumer preferences and demand. The survey was administered using a mixed-mode approach. Both printed and online questionnaires were distributed based on respondents' availability and convenience. Online forms were sent via Facebook Messenger, while printed copies were delivered in person. This method enabled broader participation in rural farming communities and institutional workplaces. Data gathering was conducted over a period of ten days, from September 8 to September 17, 2025. This timeline ensured that both supply-side and demand-side respondents were reached within a consistent period. The questionnaire gathered numerical data on mango harvest volumes, selling practices, preferred snacks, purchasing behavior, and willingness to patronize dried mango products. It was reviewed by academic mentors and revised based on their feedback to ensure clarity, relevance, and alignment with the study's objectives.

3. Market Study

3.1 Market Description

San Jose, Occidental Mindoro, is the province's main commercial and agricultural center, making it a strong market for local food products. With more than 150,000 residents across 39 barangays, it is a key hub for trade, transportation, and shopping (Philippine Statistics Authority [PSA], 2023). Its coastal location and good road connections make it a good starting point for distributing agricultural goods in the region and beyond. San Jose has a large, active consumer base, resulting in strong demand for convenient, affordable food options. Busy places like public markets, transport terminals, schools, and government offices support many sari-sari stores, school canteens, and roadside vendors. These primarily serve students, employees, and commuters seeking quick, low-cost snacks. One important location is the OMECO Multi-Purpose Cooperative (OEMCO) Canteen, which serves professionals and staff from nearby institutions, including the Philippine National Bank (PNB), LBP, and the Municipal Hall. This study identifies OEMCO canteen customers as the primary target market because they are a consistent group with regular purchasing habits and a clear interest in convenient, healthier snacks during work hours. The canteen's steady operations and central location also make it a good place to first introduce and test the dried Indian mango product before selling it more widely. In addition to physical stores, San Jose's growing use of digital platforms creates new ways to sell products. Many people use mobile phones and join platforms like Facebook Marketplace and local e-commerce groups, making it easier and cheaper to sell online across barangays (Statista, 2025). By combining in-person sales with online outreach, dried Indian mangoes can be offered as a familiar yet modern product that caters to changing consumer tastes. In summary, San Jose is a suitable location to launch a dried Indian mango business. Its rich agricultural resources, diverse consumer base, and easily accessible sales channels, such as the OEMCO canteen, make it a promising market for a local product that offers both economic and nutritional benefits.

3.2 Supply Analysis

A comprehensive supply analysis is essential in determining the feasibility of producing dried Indian mango in San Jose, Occidental Mindoro. This involves examining not only the availability of raw materials but also the broader dynamics of production and demand. As noted by Rose (2018), supply analysis is based on the analysis of supply and demand. Additionally, factors such as production expenses, raw material costs, and workers' compensation must all be included in supply analysis (Srinivasan et al., 2018). To understand local supply, five Indian mango farmers from the barangays of Camburay, Central, San Isidro, and Mapaya in San Jose, Occidental Mindoro, were surveyed. They shared information about their harvest sizes, pricing, and customer connections. These insights help demonstrate the potential for sourcing mangoes for the business and assess whether local farmers are prepared to support dried mango production.

Table 1
Indian Mango Harvests per Season by Selected Farmers in San Jose

Farmer Code	Location	Harvest per Season (sacks)
F1	Camburay	20-30
F2	Central	11-20
F3	San Isidro	11-20
F4	San Isidro	1-5
F5	Mapaya	6-10

Table 1 shows the seasonal harvest volumes of Indian mangoes from farmers in San Jose. Camburay records the highest yields at 20–30 sacks per season, while San Isidro and Mapaya report smaller harvests ranging from 1 to 20 sacks. These differences reflect varying farm capacities, suggesting that while some growers can provide larger supplies, others contribute modest amounts. Overall, the figures indicate that local sourcing is possible but will require coordination among farmers to maintain a steady supply for dried mango production.

3.3 Demand Analysis

Demand analysis helps estimate customer demand, guiding decisions on pricing, production, and market strategy (MBA Skool Team, 2023). Demand is the desire for the product, and it includes both prospective and retrospective studies to accurately forecast the market and understand the product's historical successes and failures (Gano et al., 2019).

Table 2
Respondents' Interest in Dried Indian Mango with a Twist

Response Option	Frequency	Percentage
Yes	178	99.00
Maybe	1	1.00
Total	179	100.00

Table 2 shows a strong potential demand for dried Indian mango among OMECO and LBP employees. Almost all respondents (99%) said they would buy the product, and only one was uncertain. No respondents rejected the idea. This high level of interest suggests the product is likely to be well accepted and ready for local commercialization (Jorge et al., 2020).

Table 3
Frequency and Percentage of Demand per Purchase

Quantity per purchase	Frequency	Percentage
1 pack	50	27.93
2-3 packs	96	53.63
4-5 packs	25	13.97
More than 5 packs	8	4.47
Total	179	100.00

Table 3 shows the number of dried Indian mango packs employees are willing to buy per purchase. Most respondents (53.63%) prefer 2–3 packs, while 27.93% choose a single pack, and smaller groups purchase 4–5

packs (13.97%) or more than 5 packs (4.47%). This indicates moderate demand, with consumers open to buying multiple packs, supporting production planning and marketing strategies (Alsubhi et al., 2022).

Table 4 shows that 58% of respondents are willing to pay more than ₱40 per pack of dried Indian mango with a twist. This indicates a strong interest in the product, even at a higher price. Some prefer mid-range prices, and a few are willing to pay up to ₱120, suggesting potential for premium options.

Table 4
Price Range Acceptance Among Respondents

Price range(PHP)	Frequency	Percentage
Below 20.00	2	1.00
20.00-30.00	22	12.00
31.00-40.00	50	28.00
Above 40.00	103	58.00
Others (110 & 120)	2	1.00
Total	179	100.00

Based on survey results, dried Indian mango holds a 10% share, while chips and other dried fruits dominate with 57%, and other snacks account for 33%. Despite the relatively small share, the 10% allocation for dried Indian mango is a conservative estimate, grounded in earlier findings where 99% of 179 respondents expressed willingness to patronize the product (as shown in Table 5). This careful estimate reflects the researcher's goal of accurately measuring the product's initial market position while also acknowledging strong consumer interest. The 10% share is the target for the product's early launch. It provides an early sign of potential demand and offers a safe yet hopeful outlook for entering the market and future growth. As more people learn about and can buy the product, its market share could grow, especially since it aligns with consumer preferences for healthy, local snacks (Alsubhi et al., 2022).

Table 5
Frequency and Percentage of Preferred Munchies

Munchies	Frequencies	Percentage
Chips	46	26.00
Cookies	34	19.00
Candies	6	3.00
Dried Fruits	56	31.00
Nuts	37	21.00
Total	179	100.00

Table 5 shows the types of munchies preferred by the respondents. Local small businesses offer these products. Preferences are influenced by utility maximization, price sensitivity, and psychological triggers (Dillon, 2025). On the other hand, recent research has shown that product availability, quality, and price are among the main reasons for customer preferences, with accessibility playing a significant role in shaping demand (Melović et al., 2020).

3.4 Demand and Supply Analysis

Markets work through the interaction of supply and demand, which affect product availability, pricing, and business sustainability. Demand is the amount of a product that consumers are willing and able to purchase at various price levels. At the same time, supply reflects the quantity producers are willing to offer based on costs, competition, and available resources. Ichwandiani and Hasanah (2025) highlight that both consumer behavior and production challenges shape market access and pricing in Philippine agriculture. This study found strong consumer interest in dried Indian mango with a twist. In a survey, 99.44% of 179 respondents said they would buy the product, and 53.63% said they would buy 2 to 3 packs each time, indicating steady, repeat demand. This aligns with national trends, as more people in the Philippines choose fruit-based snacks for health and convenience. Processed fruit products are particularly popular among urban consumers seeking healthier options (Balita, 2025).

The five-year population growth projection for San Jose, Occidental Mindoro, based on a 1.41 percent annual growth rate, indicates a steadily expanding consumer base for dried Indian mango from 2026 to 2030. With 99

percent of survey respondents expressing willingness to purchase the product, the study conservatively assumes a 10 percent market share, resulting in an estimated demand of 150,026 units in 2026 and rising to 158,667 units by 2030. This projection reflects both the popularity of dried mangoes and other snack products among Filipinos, as observed during retail visits, and the strong acceptance shown in the survey. However, supply projections reveal a consistent gap between demand and production capacity, with annual shortages ranging from 55,009 to 58,178 units, equivalent to 58 percent unsatisfied demand. These findings highlight both the significant market potential for dried Indian mango and the need to expand production capacity to meet consumer demand and reduce unmet market opportunities (Sulistiyawati et al., 2020).

Table 6
Five-Year Projected Population, Market Share, Demand, and Supply of Dried Indian

Year	Projected Population	Willingness to purchase	Projected Market Share (10%)	Projected Supply	Demand and Supply Gap Annually	Unsatisfied Demand
2026	166,696	99%	150,026	95,017	55,009	58%
2027	169,046	99%	152,141	96,356	55,785	58%
2028	171,429	99%	154,286	97,715	56,571	58%
2029	173,846	99%	156,461	99,092	57,369	58%
2030	176,297	99%	158,667	100,489	58,178	58%

3.5 Marketing Strategies

The strategies below use the marketing mix to support this proposal.

Product. The enterprise will produce high-quality dried Indian mango, highlighting its firmer texture and tangy-sweet flavor compared to the Carabao variety. Flavored variants such as sweet chili and honey glaze will cater to evolving consumer preferences. Products will be preservative-free, packaged in eco-friendly resealable bags, and offered in snack-size and bulk packs.

Price. Pricing is set to balance affordability and profitability, starting at ₱35.00 per 50g pack in 2026 and gradually increasing to ₱42.35 by 2030 to account for inflation. Discounts for bulk purchases and loyal customers will encourage repeat buying and expand market reach.

Distribution Channel. Products will be sold through direct and retail channels, including a store near government offices, sari-sari stores, school canteens, transport terminals, and stalls in public and night markets. Online platforms such as Facebook Marketplace and Instagram will support digital sales, with options for pick-up, delivery, and wholesale arrangements.

Promotion. Traditional and digital strategies will highlight the unique qualities of the Indian mango. Eye-catching content will be shared on Facebook, Instagram, TikTok, and Messenger, while tarpaulins in high-traffic areas and free tasting sessions at community events will increase visibility. Collaborations with local stores and school canteens will further expand accessibility.

3.6 Product Description

The dried Indian mango snack offers a nutritious, convenient option rich in vitamins A and C. Flavors such as sweet chili and honey glaze provide variety and modern appeal, helping the product stand out in local markets and gift packs. Lightweight and ready to eat, the mangoes are shelf-stable for six months at room temperature or up to one year when refrigerated. Packaged in eco-friendly pouches, they are suitable for retail, gifting, and online sales, making them a practical and distinctive product from Mindoro.

3.7 Production Process

The production of dried Indian mangoes involves several careful steps designed to ensure that each snack is

safe, high-quality, and consistent. Fresh Indian mangoes are transformed into a healthy, flavorful, shelf-stable product through clean processing methods and minimal additives. Fresh Indian mangoes are procured directly from farmers in San Jose, Occidental Mindoro, and preserved through freezing to ensure year-round availability. Fruits are sorted, washed, sanitized, peeled, and sliced into uniform ¼ -inch pieces, yielding about 70% usable portions. Slices are pre-frozen at -18°C to prevent clumping and stored until needed. For flavored variants, slices are marinated in honey or sweet-chili mixtures before drying. Dehydration is performed at 55–60°C for 8 hours using food-grade equipment, producing consistent, hygienic results. Finished slices are cooled, inspected, packed into 50g eco-friendly pouches, and labeled with product details. Products are stored in a cool, dry place and distributed through local stores, canteens, and online platforms. This process ensures quality, flexibility, and a steady supply throughout the year (Dry Storage, 2025).

3.8 Selling Process

The selling process will involve distributing dried Indian mango to various retail outlets, including public markets, school and office canteens, transport terminals, pasalubong centers, and other stores. These locations will serve as key access points for both local consumers and travelers. To increase convenience, delivery services will be offered for bulk and individual orders. Customers can also place orders online via social media and e-commerce sites, making it easy to shop from home or while traveling.

Table 7
Production Equipment, Tools, Materials, Supplies, Service Vehicle, and Furniture & Fixtures in Producing Dried Indian Mango with a Twist

Equipment & Tools	Usage	Estimated Life Span	Quantity	Unit Cost (PHP)	Total (PHP)	
Stainless Steel Knives	Peeling and slicing	2.5 years	5 pcs	600.00	3,000.00	
Cutting boards	Slicing surface for hygiene	2.5 years	3 pcs	1,000.00	3,000.00	
Mixing bowls	Preparing flavor infusions	2.5 years	3 pcs	350.00	1,050.00	
Dehydrator (with trays)	Drying mango slices efficiently	5 years	3 units	10,000.00	30,000.00	
Weighing scale (digital)	Accurate portioning for packaging	5 years	1 unit	1,500.00	3,000.00	
Heat sealer	Sealing packaging pouches	5 years	1 unit	400.00	400.00	
Vacuum Sealer	Removing air before freezing peeled Mango slices	5 years	2 unit	5,000.00	10,000.00	
Chest Freezer	Storing pre-frozen mango slices for year-round processing	5 years	3 units	20,000.00	60,000.00	
Refrigerator	Thawing of frozen mango slices	5 years	1 unit	17,000.00	17,000.00	
Total					127,450.00	
Office Equipment	Usage	Estimated Life Span	Quantity	Unit Cost (PHP)	Total (PHP)	
Cellphone	Mobile Communication with clients/suppliers	5 years	1 unit	3,189.00	3,189.00	
Electric Fan	For ventilation	5 years	1 unit	1,500.00	1,500.00	
Total					4,689.00	
Packaging materials	Usage	Estimated Life Span	Quantity	Unit Cost (PHP)	Daily Cost (PHP)	Total (PHP)
Packaging	Resealable pouches for the final product	One-time	200 pcs	2.50	500.00	10,500.00
Total					10,500.00	
Production Supplies	Usage	Estimated Life Span	Quantity	Unit Cost (PHP)	Daily Cost (PHP)	Total (PHP)
Freezer-Grade Laminated food pouch	Bulk freezing of peeled mango slices	One-time	35 pcs	4.00	140.00	2,940.00
Total					2,940.00	
Office Supplies & Materials	Usage	Quantity	Unit Cost (PHP)	Total (PHP)		
Ballpen	Writing and note-taking	1 box	160.00	160.00		
Calculator	Quick computations for records & sales	1 unit	650.00	650.00		
Record book	Logging transactions and inventory	1 pc	135.00	135.00		
Whiteboard, wallmount 2'x4'	Displaying notes, schedules, and reminders	1 unit	650.00	650.00		
Whiteboard marker	Writing on a whiteboard	1 pc	49.00	49.00		
Marker refill	Extending the use of whiteboard markers	1 pc	105.00	105.00		

A feasibility study on dried Indian mango production business in San Jose, Occidental Mindoro

Fire Extinguisher	For emergency fire	1 unit	1,000.00	1,000.00	
Total				2,749.00	
Janitorial Supplies	Usage	Quantity	Unit Cost (PHP)	Total (PHP)	
Broom and dustpan	Sweeping and collecting dirt	1 set	300.00	300.00	
Mop and bucket	Cleaning and sanitizing floors	1 set	250.00	250.00	
Cleaning rags	Wiping surfaces and equipment	20 pc	8.00	160.00	
Disinfectant	Sanitizing work and common areas	5 liters	350.00	1,750.00	
Trash bins and disposal	Waste collection	2 units	100.00	200.00	
Trash bags	Lining bins for easy waste removal	30 packs	39.00	1,170.00	
Hand soap	Hand hygiene	5 bottles	75.00	375.00	
Total				4,205.00	
Service Vehicle	Usage	Estimated Life Span	Quantity	Unit Cost (PHP)	Total (PHP)
Delivery Vehicle	For product delivery	5 years	1 unit	45,000.00	45,000.00
Total					45,000.00
Furniture & Fixtures	Usage	Estimated	Quantity		Total Cost
Table and chair	Work space for staffs	5 years	1 set	1,999.00	1,999.00
Storage Cabinet	For storing products, supplies, or tools	5 years	1 unit	1,500.00	1,500.00
Total					3,499.00

Table 7 presents the essential resources and materials required for the dried Indian mango processing enterprise, encompassing production equipment, office tools, packaging materials, storage pouches, supplies, delivery vehicles, and furniture and fixtures. Core processing equipment supports each stage of the workflow, from peeling and slicing to flavor infusion, dehydration, weighing, sealing, freezing, and thawing. In contrast, office equipment, such as a cellphone and an electric fan, ensures communication and workplace comfort. Packaging needs are addressed through resealable consumer pouches for 50-gram servings and freezer-grade laminated pouches for bulk storage, both designed to maintain product quality and convenience. Daily operations are supported by office supplies for record-keeping and safety, as well as janitorial materials to uphold hygiene standards. A cargo e-bike provides efficient delivery to local outlets, and furniture and fixtures help organize supplies and create a functional workspace. Together, these resources form the foundation for sustainable operations, balancing efficiency, product integrity, and workplace safety (Birt, 2025).

Project Location. The enterprise will initially operate from a rented house along Lanzones Road, Barangay Pag-asa, San Jose, Occidental Mindoro. The site provides adequate space for small-scale production and allows a cost-efficient setup while remaining close to mango-producing barangays. Formal approval from the Barangay Council and concerned authorities will be secured, with plans to relocate to a dedicated facility once the business expands. Distribution will focus on the OEMCO canteen at the OMECO Main Office, a strategic site with steady customer traffic from employees, walk-in clients, and nearby institutions. Additional outlets include school canteens, transport terminals, the public market, and the night market, which collectively reach students, commuters, residents, and tourists. By combining production at a practical rental site with high-traffic distribution points, the project aims to maximize reach, maintain efficiency, and establish a strong local presence (One link, 2026).

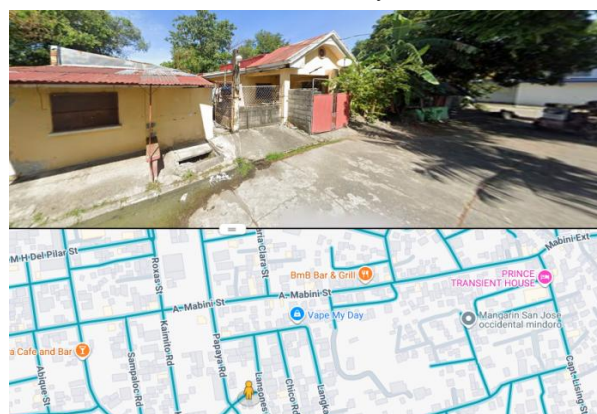


Exhibit 1. Vicinity Map of the Production Area for the Proposed Business

Exhibit 1 presents the vicinity map of the proposed business production site, located along Lanzones Road, in front of PH2 San Jose Water District, near Doña Consuelo Subdivision Plaza, Brgy. Pag-asa, San Jose, Occidental Mindoro.

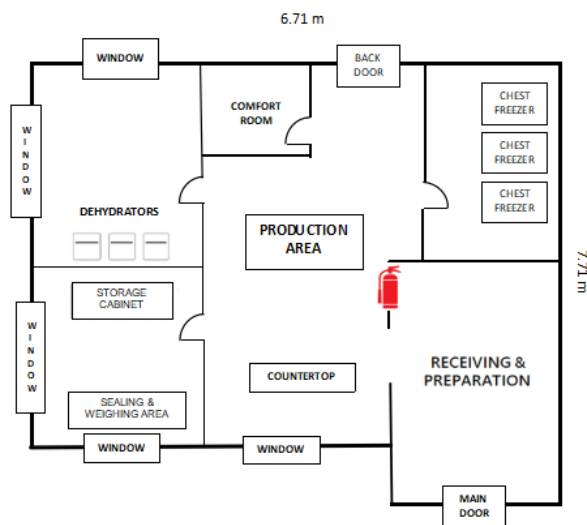


Exhibit 2. Lay out the Production Area of the Proposed Business

Exhibit 2 shows the layout of the production area. The facility is organized into functional zones that support hygienic handling, efficient workflow, and safe processing from raw mango intake to final packaging.

4. Organization and Financial Study

4.1 Source of Financing

The proposed business will hire personnel: one assistant cook and one deliveryman/helper. Since this is a sole proprietorship, the owner will use her personal savings to cover all business expenses and capital needs. The total project cost is estimated at ₱312,711.38. Below is the estimated project cost.

Table 8

Total Project Cost

Property, Plant and Equipment	Items	Description
Production Equipment	127,450.00	180,638.00
Service Vehicle	45,000.00	
Office Equipment	4,689.00	
Furniture and Fixtures	3,499.00	
Total Property, Plant and Equipment		
Pre-Operating Expenses		132,073.38
Raw Materials	57,403.50	
Packaging Costs	10,500.00	
Production Supplies	2,940.00	
Office Supplies and Materials Expense	2,749.00	
Janitorial Supplies	4,205.00	
Rent Expense	6,000.00	
Utilities Expense	6,800.00	
Personal Protective Supplies Expense	550	
Permits and Licenses	5,000.00	
Promotional Expenses	1,990.00	
Employee Salary	30,035.00	
Government Mandatory Contributions	3,900.88	
Total Property, Plant and Equipment		
Total Project Cost		

The project costs include the fixed assets, or property, plant, and equipment (PPE), of the proposed business, which are essential at the start of operations. Project costs also include pre-operating expenses like one month's worth of ingredients for dried Indian mangoes, packaging, rent, utilities, protective supplies, employee salaries, and required government contributions. They also cover initial costs for office and janitorial supplies, business permits and licenses, and promotional materials needed to start the business. Production will begin in the 10th week after all pre-operational activities are finished. Moreover, the proposed business will be registered as a sole proprietorship. The initial capital outlay required to start operations is ₱328,285.00, which includes fixed assets totaling ₱128,200.00 and pre-operating expenses of ₱200,085.00. This capital will be sourced from the proponent's personal savings.

4.2 Financial Assumptions

(1) The proposed daily production is 200 pouches, with output expected to grow by 10% annually. (2) The selling price will start at ₱35 per pack, increasing by 10% every two years beginning in the second year (₱38.50 in years two and three, and ₱42.35 in years four and five). (3) Production will operate 21 days each month, totaling 252 days per year. (4) Ingredient and packaging costs are projected to rise by 5% annually. (5) Assets will be depreciated using the straight-line method. (6) Operating expenses—including office supplies, production materials, janitorial needs, rent, utilities, protective equipment, permits, licenses, and promotions—will also increase by 5% per year. (7) Salaries, 13th-month pay, and government contributions are expected to grow by 2% annually. (8) An allowance for spoilage is set at 3% of production. (9) Based on projected sales, the business will remain under the ₱3 million threshold for NON-VAT registration (subject to 3% percentage tax) during the first four years. However, it will exceed this threshold in the fifth year, requiring VAT registration.

5. Financial Projections

Financial Ratios and Analyses

Gross Profit Ratio. Manglik (2016) explains that the Gross Profit Ratio (GPR) indicates the amount of profit a business generates from selling products or services before deducting administrative costs. This ratio helps measure how efficiently a business produces goods and services. To find the GPR, subtract the cost of direct materials, labor, and overhead from total sales, then divide that number by total sales. Over the course of five years, the business would have achieved a GPR of 54% in its first year. This means that for every peso earned, ₱0.54 would be the gross profit. In the next four years, the GPR would be 56%, 54%, 56%, and 54%, showing steady profitability during the projection period.

Net Profit Ratio. According to Indrati and Putri (2021), the Net Profit Margin (NPM) measures the proportion of net income relative to total sales after accounting for all business expenses. This ratio indicates the percentage of profit earned per peso of revenue, after accounting for all costs and expenses. A higher NPM signifies a more profitable business. For the proposed business, the net profit margin in the first year is 11%, indicating that for every peso of sales, the business earns ₱0.11 in net profit. The projected NPMs for the second to fifth years are 19%, 18%, 25%, and 22%, respectively.

Return on Investment. According to Fernando (2025), Return on Investment (ROI) is a financial metric that measures the profit generated by an investment relative to its costs. Important factors that affect ROI include the initial capital, ongoing maintenance costs, and the cash generated by the investment. ROI is calculated by dividing the return from an investment by the total expenditure incurred. The business is expected to recover its initial investment by the second year of operation. By that time, cumulative profits are projected to exceed twice the original capital. This indicates strong financial performance and high profitability (Alshehadeh et al., 2024). The upward trend in ROI, from 60% in the first year to over 220% by the fifth year, demonstrates the viability and growth potential of the dried Indian mango enterprise.

Socio-Economic Aspects - This dried Indian mango snack business is not just about making a profit. It is

about building something meaningful for the community. By working closely with local farmers, hiring local workers, and offering a product that reflects the region's agricultural strengths, the business becomes part of a bigger story. It supports livelihoods, encourages entrepreneurship, and celebrates local identity (Paula et al., 2021). As the person behind the business, the owner benefits not only financially but also professionally. Running the operation allows her to apply her skills in planning, documentation, and production management. It also helps her grow her network and reputation. Over time, this venture can become a model for others who want to start their own small-scale food businesses. Even with a small team, the business creates real opportunities for local workers. From preparing mangoes to packaging and delivery, each role offers fair pay and hands-on experience. These jobs help families earn a steady income and give workers a chance to learn new skills they can use in future ventures or employment. The business relies on fresh Indian mangoes sourced directly from nearby farms. This steady demand gives farmers a reliable market for their harvests and encourages them to keep improving their practices. It is a win for both sides.

The business gets quality fruit, and farmers get consistent income and recognition for their work. By operating legally and responsibly, the business contributes to local government revenue through taxes, permits, and fees. It also supports broader goals like reducing unemployment and promoting agri-based industries. As the product gains attention, it may even help boost tourism and local pride in San Jose's homegrown products. The final product is a healthy, locally made snack that offers something different from mass-produced options. It is free from artificial preservatives and made with care. This makes it a great choice for people who want to eat better and support local businesses. It also helps reconnect consumers with the value of Filipino-grown produce.

6. SWOT and Potential Problem Analysis

6.1 Strengths and Weaknesses of the Dried Indian Mango Snack Business

On the positive side, the product uses fresh mangoes from nearby farms, ensuring high quality while also supporting local growers. Because the fruits are sourced directly, the snack remains affordable without losing its natural taste and freshness. The business location is another advantage, as it is close to schools, homes, and commercial areas, making it easy for customers to access the product. Social media also plays a big role, helping the business reach more people, offer free delivery, and build trust through real customer feedback. The product itself is simple, clean, and preservative-free, which fits well with the growing preference for healthier, locally made snacks (Dwivedi et al., 2021). On the other hand, some challenges need attention. The short shelf life of dried mango slices can lead to spoilage if not stored properly, resulting in waste or buyer dissatisfaction. The business also relies heavily on manual labor for slicing, drying, and packing, which can slow down production and sometimes affect consistency. Finally, as a new brand, it still has limited recognition and trust in the market, meaning it will take time and effort to establish a solid reputation.

6.2 Opportunities

There are many chances to grow. The business can work with local agencies such as the Department of Science and Technology – Provincial Science and Technology Office (DOST PSTO) and the Municipal Agriculture Office (MAO) of San Jose to improve production and receive support. These partnerships can help with training, technology, and a steady supply of mangoes. The product can also be improved by offering new flavors, dips, or special packaging for events. These ideas can attract more customers and increase sales. With more people seeking clean, local food, the business has a good chance of expanding into school canteens, weekend markets, and even tourist spots. The growing population of tricycle and motorcycle drivers in San Jose presents a significant opportunity for long-term sustainability. As transportation demand increases, more individuals will apply for new licenses or renew their licenses, creating consistent demand for review services. There is also an opportunity to expand services in the future. The center may offer refresher courses for license renewals, special review sessions for professional driver applicants, or seminars on traffic law updates and responsible driving practices. This

diversification can broaden revenue sources and strengthen market position. Technological advancement presents another opportunity. The integration of computer-based mock examinations and digital learning materials can enhance service quality and attract younger applicants who are more comfortable with digital platforms. Moreover, increasing public awareness of road safety and compliance with traffic regulations creates a favorable environment for educational services focused on driver competency. As enforcement becomes stricter and examinations remain competency-based, applicants may recognize the importance of structured preparation. While for threats, other snack makers and native delicacy sellers may compete, especially those with loyal customers and lower prices. If the business does not continue to improve or remain consistent, it might lose its edge. External problems like bad weather, power outages, or rising mango prices can also affect production. These risks need to be managed carefully (Thomas & Helgeso, J., 2021).

7. Conclusions

The study confirmed the financial viability, feasibility, and market potential of the dried Indian mango snack business in San Jose, Occidental Mindoro. Based on the findings, several conclusions were drawn: (1) there is clear demand for dried Indian mango snacks, supported by consumer interest and willingness to purchase the product; (2) the enterprise can provide a steady supply of affordable yet high quality mango snacks, making it competitive in the local market; (3) the chosen location is strategic, being close to residential areas, schools, and commercial centers, which allows easy access and distribution; (4) as a small scale enterprise, sole proprietorship is the most practical management structure, giving the owner direct control over operations; (5) the project requires a manageable investment, making it accessible for startup while still offering strong profitability; and (6) the business contributes to socio economic development by creating jobs, generating government revenue, supporting local farmers, and offering consumers healthier food options rooted in local identity.

Recommendations - Based on the findings, several measures are suggested to strengthen the dried Indian mango business. The owner should build strong partnerships with local farmers to secure a consistent supply of high-quality fruit and reduce the risk of shortages. Preservation methods such as vacuum sealing or controlled dehydration may be adopted to extend shelf life. Gradual investment in semi-automated equipment is recommended to improve efficiency and product consistency. Marketing should highlight local origin, health benefits, and cultural value through social media, trade fairs, and free sampling in schools and communities. To address external risks, the owner should invest in a generator set, monitor power schedules, and maintain frozen stock during peak harvests. Worker training on food safety, hygiene, and packaging, supported by agencies such as DOLE, DTI, and DA, will enhance product quality. Financing options such as microloans or community-based crowdfunding can support equipment upgrades and expansion. Product innovation, such as blending dried mango with tamarind for new flavor profiles, may attract diverse markets. Finally, collaboration with academic institutions and researchers is encouraged to explore consumer preferences and expand distribution into tourism and regional trade fairs.

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A feasibility study on starting a kalabasa chips business in San Jose, Occidental Mindoro

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Abstract

This feasibility study, using a descriptive research design, examines the potential of establishing a Kalabasa Chips business in San Jose, Occidental Mindoro, as a nutritious, affordable, and community-based snack enterprise. The study assessed consumer demand, local supply availability, and financial viability through surveys, interviews, and supply chain analysis. Findings reveal that Kalabasa Chips, made simply from squash and salt, are widely accepted by consumers who prefer healthier alternatives to conventional snacks. The abundance of squash in the province ensures a sustainable, low-cost supply of raw materials. At the same time, financial projections indicate that the business can recover its initial investment within 1 year and 9 months, confirming both technical and economic feasibility. Beyond profitability, the project supports local farmers, promotes value-added processing, and contributes to livelihood and community development. The study further highlights the importance of strategic location, cooperative linkages, and branding in establishing market presence. Based on these findings, small-scale production, targeted promotional strategies, and gradual expansion are recommended to ensure long-term sustainability and growth.

Keywords: Kalabasa Chips, value-added processing, healthy snacks, local supply availability, local farmers

A feasibility study on starting a kalabasa chips business in San Jose, Occidental Mindoro

1. Introduction

In the Philippines, food plays a big role in shaping cultural identity, bringing communities together, and supporting the economy. From lively fiestas to daily family meals, Filipino cooking shows both creativity and resourcefulness (Broadsheet Asia, 2025). A key part of this tradition is turning local crops into nourishing and marketable products. One example is squash (*Cucurbita moschata*), known locally as kalabasa, which is widely grown and thrives in the tropical climate of Occidental Mindoro (Cagayan Valley Department of Agriculture, 2021). Even though squash is available all year and used in many Filipino dishes, it is not often made into value-added food products. In farming towns like San Jose, Magsaysay, Rizal, and Calintaan, farmers face an oversupply, low prices, and limited options for processing their harvests after picking (Philippine Information Agency, 2022). This creates a chance to develop products that last longer, reflect local culture, and help increase income, reduce waste, and support local businesses.

This study examines whether it is possible to start a Kalabasa Chips business in San Jose, Occidental Mindoro. Fried Kalabasa Chips are thin slices of squash cooked until crispy, making a tasty, local snack that is both cheap and filling. Compared to dried versions, the researcher observes that the fried chips have more flavor and crunch, making them a favorite among people seeking a healthier snack alternative to regular junk food and supporting local farmers. Squash is rich in beta-carotene, vitamins A and C, and fiber, which can help people make healthier food choices (StuartXchange, 2021). The product matches current health trends and supports the local economy by turning abundant crops into innovative snacks. Early feedback from San Jose and nearby towns shows interest in new but familiar products (University of Northern Philippines, 2025). By selling Squash (Kalabasa) Chips in school canteens, sari-sari stores, weekend markets, and online platforms, the business can reach a wide range of customers. Beyond profitability, the project promotes inclusive growth, strengthens food security, and empowers the community, positioning Kalabasa Chips as a distinctive product that stands out in today's competitive snack market (Cajayon et al., 2024).

Objectives of the Study - The study aims to assess the viability of establishing a squash (*kalabasa*) chips business in San Jose, Occidental Mindoro, by introducing a healthy, innovative snack made from locally grown squash, identifying market demand and target consumers, and determining startup costs, pricing, and overall financial feasibility. It also seeks to identify the optimal location and operational requirements for the business, while supporting local farmers by promoting value-added uses of squash. Ultimately, the project intends to contribute to community development by fostering livelihood opportunities and encouraging entrepreneurship in the area.

Significance of the Study - The significance of this study lies in demonstrating how a squash-based snack enterprise in San Jose, Occidental Mindoro, can generate multi-sectoral benefits: for farmers, it creates new market opportunities, reduces post-harvest losses, and strengthens farm-to-market linkages; for students, it provides a practical model that bridges classroom theories with real-world business planning and product development; for aspiring entrepreneurs, it serves as a guide to resource-based enterprise creation and confidence-building in applying business strategies; for local communities, it fosters job creation, supports rural businesses, and contributes to regional economic growth; for academic institutions, it promotes research-driven entrepreneurship and community involvement; and for consumers, it introduces a healthy, affordable snack that reflects local tastes while meeting the growing demand for nutritious and sustainable food choices.

Scope and Delimitation of the Study - The study investigates the feasibility of establishing a small-scale Kalabasa Chips enterprise in San Jose, Occidental Mindoro, with a focus on transforming locally grown squash (*Cucurbita moschata*) into a healthy, affordable snack that reflects community tastes and culture. Its scope covers

marketing, production, management, financial planning, and socio-economic impact, with data collected in September 2025 through field observations and surveys of OMECO employees and local snack buyers. While squash is also cultivated in nearby municipalities, the study is delimited to San Jose to maintain focus, emphasizing modest production and localized distribution through school canteens, sari-sari stores, pasalubong centers, and online platforms, excluding export and large-scale automation. By projecting feasibility over five years (2026–2030), the research aims to introduce a nutritious snack, identify market demand, estimate startup costs, ensure financial viability, select an appropriate location, support local farmers, and foster community development.

Sources of Data - This study used both primary and secondary data. Primary data came from surveys and field observations with squash farmers in San Jose, Calintaan, and Rizal, as well as OMECO employees who represent potential customers. Farmers shared harvest schedules and supply capacity, while employees gave insights on snack preferences. Secondary data were obtained from reports of the Department of Agriculture (2020) and the Philippine Statistics Authority (2022), as well as marketing references by Armstrong and Kotler (2022). These sources guided the technical, financial, and market analysis of the squash (*Kalabasa*) Chips enterprise.

Ethical Considerations - This study was conducted with strict adherence to ethical research standards to ensure fairness, transparency, and respect for all participants and stakeholders. Respondents, including farmers and OMECO employees, were informed of the study's purpose and voluntarily participated, with their identities kept confidential and data reported only in aggregate form. The researcher upheld honesty and accuracy by recording and analyzing information truthfully and properly acknowledging secondary sources, thereby maintaining academic integrity. Respect for participants was prioritized by designing surveys and interviews to avoid discomfort and ensuring that participation was voluntary. Beyond protecting individuals, the study emphasized community benefit by promoting livelihood opportunities, supporting local farmers, and encouraging sustainable practices. Environmental responsibility was also considered, with waste disposal and resource use planned to minimize ecological impact. Finally, the researcher declared no conflict of interest, ensuring that the feasibility analysis was conducted objectively to benefit both academic and community stakeholders.

2. Methodology

This study employed a descriptive research design to assess the availability and supply capacity of squash in San Jose, Occidental Mindoro. Data were gathered through surveys with OMECO co-workers and interviews conducted in person and online, providing both numerical and qualitative insights into local production practices. Six respondents provided harvest details—volume, timing, and location—indicating an annual yield of approximately 27,250-29,250 kilograms, sufficient to sustain continuous chip production. Squash planting can occur year-round, but optimal schedules follow seasonal patterns: October to December in lowland areas and May to July in upland areas. Aligning barangay planting with these cycles ensures a steady supply, minimizes risks, and supports reliable processing for the Kalabasa Chips enterprise.

3. Market Study

3.1 Market Description

San Jose is the largest and busiest municipality in Occidental Mindoro. It covers an area of 446.70 square kilometers and had a population of 153,267 people according to the 2020 Census (Philippine Statistics Authority, 2021). As the main center of business and public services in the province, San Jose hosts banks, restaurants, and trading centers, as well as the headquarters of OMECO, which supplies electricity throughout the province. The municipality also serves as a hub for education, health services, and government offices, drawing people from nearby towns for work, study, and trade. The OMECO Employees Multi-Purpose Cooperative, Inc. (OEMCO) canteen is located in a strategic spot, just a short walk from PNB, Land Bank, and the municipal center. Every day, employees and residents pass through the area, making it an ideal place to introduce a healthy and affordable snack like Kalabasa Chips. Because it is part of a cooperative, the canteen naturally supports local products. Staff are

familiar with community-based enterprises and are likely to welcome initiatives that help farmers and small businesses, ensuring that the project is closely tied to community development.

To reach more customers, the business will also use online platforms. Selling both in person and online allows kalabasa chips to reach buyers not only in San Jose but also in nearby towns. Online selling gives flexibility in marketing, such as offering promotions during harvest season or bundling chips with other local goods. This combined approach, sales through the cooperative canteen and online channels, helps build a wider market presence and positions kalabasa chips as a sustainable local product that highlights the agricultural strength of Occidental Mindoro (Sales et al., 2024; Baylon et al., 2025).

3.2 Demand Analysis

The demand analysis evaluates consumer interest and market prospects by examining behavior and survey outcomes, emphasizing that production aligned with consumer preferences is critical for market success (Guru et al., 2024) and that community-based distribution enhances local product acceptance (Gong, 2021). In San Jose, Occidental Mindoro, surveys reveal a strong interest in kalabasa chips, with 83% of respondents expressing support or willingness to purchase (see Table 5), indicating clear market potential. This demand is reinforced by seasonal squash supply, effective marketing strategies, and localized distribution channels, including school canteens, sari-sari stores, pasalubong centers, and online platforms (Philippine Statistics Authority, 2022; Department of Agriculture, 2020).

Table 1

Consumers' Willingness to Patronize Squash (Kalabasa) Chips (n=160)

Respondents	Frequency	Percentage
Yes	133	83.00
No	0	0.00
Maybe	27	17.00
Total	160	100.00

Surveys conducted in San Jose, Occidental Mindoro, reveal strong consumer interest in kalabasa chips, with 133 of 160 respondents (83%) expressing willingness to purchase, 27 (17%) undecided, and none rejecting the product. Identified through OMECO co-employees across barangays, the respondents provide a reliable picture of local demand (Philippine Statistics Authority, 2022). This high acceptance rate indicates clear market potential, supported by seasonal squash supply, effective marketing, and local distribution strategies (Department of Agriculture, 2020; PSA, 2022). Consistent with studies emphasizing the importance of aligning production with consumer preferences and community-based distribution (Guru et al., 2024; Gong, 2021), the findings also highlight opportunities for cooperative marketing, shared processing, and value-adding initiatives that can enhance local income and reduce reliance on raw squash sales.

Table 2

Demand per Purchase among respondents

Quantity per purchase	Number of Respondents	Percentage
1 pack	63	39.40
2-3 packs	56	35.00
4-5 packs	27	16.90
More than five packs	14	8.70
Total	160	100.00

Table 2 shows strong consumer interest in kalabasa chips, based on a survey of 160 respondents in San Jose, Occidental Mindoro, with 83% expressing willingness to buy, 17% answering “maybe,” and none indicating they would not buy. These results indicate clear market potential and highlight opportunities for cooperative marketing, shared processing, and value-adding initiatives that can boost local income (Colesio et al., 2025) and reduce reliance on selling raw squash alone (Cajayon et al., 2024)

Table 3*Price Range Acceptance Among Respondents*

Price Range(PHP)	Frequency	Percentage
Below 20.00	20	12.50
20.00-30.00	78	48.80
31.00-40.00	50	31.30
Above 40.00	12	7.50
Total	160	100.00

Table 3 shows the price range acceptance of kalabasa chips among 160 surveyed consumers in San Jose, Occidental Mindoro. Nearly half of the respondents (48.8%) preferred the ₱20.00–30.00 range, making it the most favored price point for regular purchases. Another 31.3% were willing to pay ₱31.00–40.00, showing openness to slightly higher pricing for larger packs or better quality. A smaller group (12.5%) preferred prices below ₱20.00, reflecting budget-conscious buyers, while only 7.5% accepted prices above ₱40.00. No respondents suggested alternative pricing.

Table 4*Frequency and percentage of preferred chips*

Snacks	Respondents	Percentage
Banana Chips	103	64.00
Camote Chips	14	9.00
Kangkong Chips	31	19.00
Potato Chips	12	8.00
Total	160	100.00

Table 4 shows that banana chips remain the dominant local snack in San Jose, with 103 respondents (64%) preferring them, followed by kangkong chips (31, 19%), camote chips (14, 9%), and potato chips (12, 8%). The popularity of banana chips reflects cultural familiarity, affordability, and wide availability, while the results suggest that although consumers are open to alternative snacks, traditional favorites continue to lead. This underscores the role of small businesses in balancing innovation with cultural tradition to ensure both relevance and acceptance among local buyers (Chaniago, 2021).

3.3 Supply Analysis

The supply of squash in San Jose, Occidental Mindoro, is largely managed by local farmers who adjust planting schedules according to rainfall and elevation, with lowland planting from October to December and upland planting from May to July (Department of Agriculture, 2020). Although squash can grow year-round, peak harvest occurs between August and November, ensuring a strong supply during these months (Philippine Statistics Authority, 2022). Farmers typically collaborate on sorting and collecting harvests to secure fair pricing and timely delivery. From 20 kilograms of raw squash, about 17–18 kilograms of clean flesh remain, yielding roughly 5 kilograms of chips or 100 packs at 50 grams each (Department of Trade and Industry, n.d.). By coordinating with both lowland and upland growers, the enterprise can maintain a steady supply year-round, ensuring sufficient raw materials for production while providing income for farmers and supporting the growth of local enterprises in Occidental Mindoro (Department of Agriculture, 2020; PSA, 2022).

Table 5*Estimated Annual Squash Production by Identified Farmers in Occidental Mindoro*

Harvest Range	Number of Farmers	Percentage
1-5 sacks	1	16.67
More than 20 sacks	3	50.00
Others (80 sacks)	1	16.67
Others (150 sacks)	1	16.67
Total	6	100.00

Table 5 shows the harvests of six farmers in San Jose, Occidental Mindoro. One farmer gathered only 1–5

sacks, and none reported gathering between 6–20 sacks, indicating that medium-scale production is limited. Half of the farmers harvested more than 20 sacks, while two produced very large amounts of 80 and 150 sacks.

3.4 Demand-Supply Analysis

The demand for kalabasa chips is driven by consumers seeking healthier, affordable, and convenient snacks. Surveys in San Jose, Occidental Mindoro, show strong interest and repeat-purchase potential, with many respondents indicating they would buy 2–3 packs at a time. This reflects national trends favoring ready-to-eat nutritious snacks among students, professionals, and health-conscious buyers. On the supply side, the enterprise benefits from consistent squash availability from local farmers, ensuring reliable, low-cost raw materials, and a planned daily output of 100 packs that is both manageable and sustainable. Seasonal harvest patterns and packaging costs remain key considerations. Overall, the balance between strong consumer demand and stable supply supports profitability while fostering community development through cooperative marketing and value-adding initiatives (Khanal et al., 2024).

Table 6
Five-Year Projected Demand and Supply for Kalabasa chips

Year	Projected Demand	Projected Supply	Demand and Supply Gap	Unsatisfied Demand
2026	150,026	106,685	43,341	41%
2027	152,141	108,189	43,952	41%
2028	154,286	109,715	44,571	41%
2029	156,461	111,261	45,200	41%
2030	158,667	112,830	45,837	41%

Table 6 shows the five-year demand and supply projections for Kalabasa Chips from 2026 to 2030. Demand consistently exceeds supply, leaving a gap each year. In 2026, demand is 150,026 units while supply is 106,685 units, leaving 43,341 units unmet. The same trend continues: in 2027, the gap is 43,952 units; in 2028, it is 44,571 units; in 2029, it rises to 45,200 units; and by 2030, the shortfall reaches 45,837 units. This pattern highlights the need to expand production capacity to meet growing demand (Hemathilake & Gunathilake, 2022).

3.5 Graph of Market Share

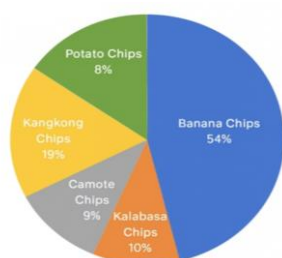


Figure 1. Graph of Market Share

Based on survey results from OMECO, kalabasa chips show strong market potential, with 83% of 160 respondents expressing willingness to purchase the product. Applying a conservative 10% market share estimate, the business anticipates around 16 regular buyers at launch, an approach that strikes a balance between opportunity and risk management (Mask & Archie, 2024; Gong, 2021).

3.6 Marketing Strategies

To promote Kalabasa Chips in San Jose, Occidental Mindoro, the business will use a community-based approach. This means the product will be introduced in ways that connect directly with local people. Tarpaulins will be placed in busy areas to attract local attention, while online platforms such as Facebook and community groups will be used to reach a wider audience. This mix of on-site visibility and online presence ensures that Kalabasa Chips are easy to discover, convenient to buy, and steadily supported by the community (Armstrong & Kotler, 2020; Kemp, 2025).

Product. The company will make Kalabasa Chips, a nutritious and inexpensive snack produced from squash cultivated in San Jose, Occidental Mindoro. Squash is naturally high in fiber and contains vitamins A and C. It

provides essential minerals such as potassium, calcium, and iron, making it a healthier option than potato or banana chips (Food and Nutrition Research Institute, 2023). The chips are thinly sliced and gently salted, with no artificial preservatives. They are packaged in resealable, eco-friendly bags for freshness and convenience. Initially, they will be sold in 50-gram packs, providing a convenient serving size that blends affordability and satisfaction. This idea turns a local crop into a crispy, flavorful, and nutritious snack. Kalabasa Chips are more than just a product; they help farmers increase the value of their harvests, develop community agriculture, and promote healthy eating habits.

Price. Price affects not only the amount spent but also how customers view a product's quality, usefulness, and benefits (Armstrong & Kotler, 2022). To make Kalabasa Chips affordable for low-income purchasers, the price will be based on survey results and current market levels (Philippine Statistics Authority, 2022). The product will remain competitive with other snack brands while maintaining excellent quality and benefiting local squash producers in San Jose (Department of Agriculture, 2023). Furthermore, incentives for bulk purchases and repeat customers will be implemented to foster loyalty and broaden market reach (Armstrong & Kotler, 2022; Department of Agriculture, 2023).

Distribution Channel. Kalabasa Chips will be distributed through local outlets and online platforms to ensure accessibility. Direct supply to the OEMCO canteen provides employees with affordable snacks, while night markets target families and workers. Online platforms such as Facebook Marketplace and Shopee expand reach, and sari-sari stores, pasalubong centers, and neighborhood groceries enhance community visibility.

Promotion. Kalabasa Chips will be promoted through both online and offline strategies to highlight them as a healthy, local snack. Online promotion will use Facebook, Instagram, TikTok, and Messenger to showcase product features and customer feedback. Offline efforts include tarpaulin displays in high-traffic areas, free tasting sessions at community events, and a referral reward system to encourage word-of-mouth. Collaboration with local outlets, such as the OEMCO canteen, night market vendors, sari-sari stores, and pasalubong centers, ensures accessibility and community presence (Sales et al., 2024).

3.7 Product Description

Kalabasa Chips are a healthy, affordable snack made from locally grown squash, naturally rich in vitamins A, C, fiber, and antioxidants. Thinly sliced, fried until crisp, lightly seasoned, and packed in 50g portions with proper labeling, they offer a convenient, ready-to-eat option for health-conscious consumers, students, and professionals. Positioned as a healthier alternative to potato or corn-based snacks, the product supports local farmers in San Jose, Occidental Mindoro, by sourcing directly from them, ensuring freshness and community impact. With an estimated shelf life of 3 months under proper storage conditions, Kalabasa Chips provide a nutritious, sustainable, and locally relevant snack option (Villanueva et al., 2024).

3.8 Production Process

Kalabasa Chips are prepared through a step-by-step process to ensure crispness, flavor, and food safety. Fresh squash from local farmers is washed, peeled, and sliced into uniform pieces (2–3 mm thick). The slices are soaked in cold water for 10–15 minutes to reduce sugars and starch and then air-dried for 30 minutes to enhance texture (Food and Nutrition Research Institute, 2023). They are fried in palm oil at 170–180 °C for 2–3 minutes until golden and crisp, drained of excess oil, and lightly seasoned with iodized salt. After cooling at room temperature for 10–15 minutes, chips are weighed into 50-gram portions, packed in moisture-resistant pouches, sealed at 120–150 °C, labeled, and stored in a cool, dry place below 30 °C.

Table 7 presents the daily ingredient cost of kalabasa chips at ₱668, equivalent to ₱17,368 per month, with squash comprising the largest share, followed by palm oil, and salt contributing minimally (Department of Agriculture, 2022; Philippine Statistics Authority, 2022). These results show that production can be sustained at relatively low cost, ensuring affordability for consumers while maintaining product quality and supporting long-

term sustainability.

Table 7*Ingredients for 100 packs of Squash (Kalabasa) chips*

Ingredients	Measurement	Purpose
Raw Squash	20.00 Kg	Main vegetable base
Palm Cooking Oil	3.00 L	Frying medium
Iodized Salt	.10 Kg	Flavoring and preservation

3.9 Selling Process

Kalabasa Chips will be sold through community-focused outlets and online platforms to ensure accessibility. Distribution begins at the OEMCO canteen, local night markets, and nearby stores, integrating the product into everyday life. Online sales via Facebook Marketplace and Shopee extend reach and convenience for households. Prices remain affordable while maintaining quality, with discounts for bulk buyers and resellers to encourage loyalty and create small income opportunities. This approach keeps Kalabasa Chips visible, affordable, and rooted in the local community while supporting farmers, promoting entrepreneurship, and sustaining local enterprise (Department of Agriculture, 2023; Philippine Statistics Authority, 2022).

Table 8*Office Equipment, Production Equipment, Tools, Materials, Supplies, Service Vehicle, and Furniture & Fixtures in Producing Kalabasa chips*

Office Equipment						
Description	Usage	Life (years)	Span	Quantity	Unit Cost (PHP)	Total (PHP)
Cellphone	For communication	5		1 unit	1,999.00	1,999.00
Electric Fan	For ventilation	5		1 unit	750.00	750.00
Total						2,749.00
Production Equipment						
Description	Usage	Life (years)	Span	Quantity	Unit Cost (PHP)	Total (PHP)
Commercial Machine Slicer	Ensures accurate and uniform slicing of raw materials	5		1 unit	7,500.00	7,500.00
Heavy-duty Gas fryer	For cooking the product	5		1 unit	4,000.00	4,000.00
Heat sealer	For sealing the package	5		1 unit	500.00	500.00
Total						12,000.00
Production Tools						
Description	Usage	Quantity	Unit Cost (PHP)	Total (PHP)		
Precision Digital Scale	for accurate measurement	1 unit	500.00	500.00		
Large Basins	for washing squash and catching chips from the frying machine	1 unit	100.00	100.00		
Tong	for stirring chips in hot oil	2 units	50.00	100.00		
Stainless draining trays	for removing excess oil to improve quality	2 units	500.00	1,000.00		
Chopping board	for a clean, stable cutting surface	2 units	75.00	150.00		
Knife	for cutting, chopping, and slicing	2 units	90.00	180.00		
Measuring Cup & Spoons	for precise measurement of ingredients	2 units	70.00	140.00		
Total						2,170.00
Production Supplies						
Description	Usage	Quantity	Unit Cost (PHP)	Daily (PHP)	Monthly (PHP)	
Packaging Materials	Resealable pouches and product label. (Single use)	100 pcs	1.50	150.00	3,900.00	
Total						3,900.00
Office Supplies and Materials						
Description	Usage	Quantity	Unit Cost (PHP)	Total (PHP)		
Ballpen	For the transactions	1 box	160.00	160.00		
Calculator	For computation	1 unit	650.00	650.00		
Record Book	For recording transactions	1 pc	135.00	135.00		
Whiteboard, wall mount 2'x4.4.'	For order and reminders	1 pc	650.00	650.00		
Whiteboard marker	For writing	1 pc	49.00	49.00		
Marker refill	For marker refill	1 pc	105.00	105.00		

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Fire Extinguisher	For emergency fire	1 unit	1,000.00	1,000.00
Total				2,749.00
Janitorial Supplies				
Description	Usage	Quantity	Unit Cost (PHP)	Total (PHP)
Broom & Dustpan	For ensuring cleanliness and proper sanitation in the workplace	1 set	300.00	300.00
Disinfectant		5 liters	75.00	375.00
Floor mop		1 pc	250.00	250.00
Liquid Detergent		4 bottles	60.00	240.00
Sponge		1 dozen	75.00	75.00
Trash can		2 units	100.00	200.00
Total				1,440.00
Service Vehicle				
Description	Usage	Quantity	Unit Cost (PHP)	Total (PHP)
E-bike with a back seat	For the delivery of the product	1 unit	35,000.00	35,000.00
Total				35,000.00

Table 8 presents the essential resources to ensure efficient production, safe handling, and smooth operations. Production equipment supports cooking, storage, and food safety, enabling consistent product quality. Office equipment, such as a cellphone and an electric fan, facilitates communication, coordination, and workplace comfort, while office supplies ensure accurate recording and transactions. A service vehicle is included to support logistics, enabling the timely delivery of raw materials and finished products to outlets and customers. Janitorial supplies maintain sanitation standards critical for food safety, preventing contamination and ensuring product quality. Together, these resources provide reliable production, effective management, clean facilities, and efficient distribution, sustaining the delivery of high-quality Kalabasa Chips.

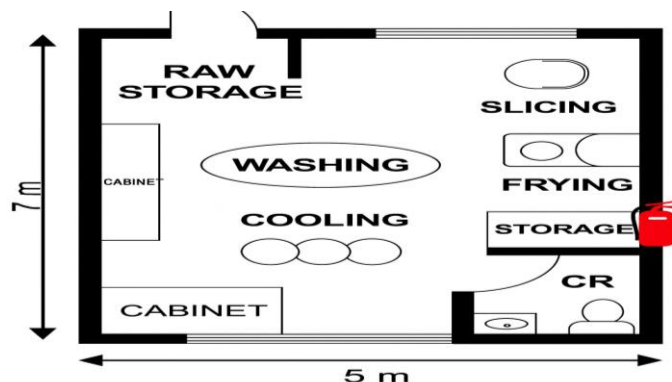


Exhibit 1. Floor Plan of the Production Area for the Proposed Business

Exhibit 1 shows the proposed location and layout of the production area. The facility is housed in a separate building from the researcher's residence, ensuring that production activities are conducted independently and in compliance with food safety standards.

4. Organization and Financial Study

The proposed business will hire two personnel, one manager and one worker/helper. The organizational chart shows the flow of the business operation.

Source of Financing

Table 9
Total Project Cost

Items	Description	Cost	Total Cost
Property, Plant and Equipment	Production Equipment	12,000.00	
	Production Tools	2,170.00	
	Service Vehicle	35,000.00	
	Office Equipment	2,749.00	
	Furniture and Fixtures	3,299.00	55,218.00

	Raw Materials	17,368.00	
	Packaging Costs	3,900.00	
	Office Supplies and Materials Expense	2,749.00	
	Renovation Expense	5,000.00	
	Janitorial Supplies	1,440.00	
Pre-Operating Expenses	Utilities Expense	2,300.00	
	Personal Protective Supplies Expense	980.00	
	Permits and Licenses	5,000.00	
	Promotional Expenses	1,240.00	
	Employee Salary	17,500.00	
	Government Mandatory Contributions	2,537.00	60,014.00
Total			115,232.00

The proposed business will be registered as a sole proprietorship. The initial capital outlay required to start operations is ₱115,232.00, which includes fixed assets totaling ₱55,218.00 and pre-operating expenses of ₱60,014.00. This capital will be sourced from the proponent's personal savings. The initial capital outlay required to begin operations amounts to ₱115,232.00, as shown in Table 9, comprising ₱55,218.00 for fixed assets, including production equipment, tools, office equipment, a service vehicle, and furniture. The remaining costs cover pre-operating expenses, including renovation, permits and licenses, promotional activities, and one month of production inputs (materials, packaging, utilities, salaries, and government contributions). Annual provisions for office, janitorial, and protective supplies are also included to ensure readiness before the official start of production.

Financial Assumptions - The proposed business will operate with a daily production capacity of 100 pouches, increasing by 10% annually, and a selling price of 20 pesos per pouch, also increasing by 10% annually. Production is planned for 26 days per month, totaling 312 days per year. Ingredient and packaging costs, office supplies, janitorial supplies, utilities, personal protective equipment, permits, licenses, and promotional expenses are expected to rise by 5% annually. Salaries, 13th-month pay, and mandatory government contributions will increase by 2% per year, while the spoilage allowance is set at 1% of production. Business assets will be depreciated using the straight-line method. The enterprise will register as non-VAT and pay a 3% Other Percentage Tax based on sales, ensuring compliance with tax regulations while maintaining cost efficiency.

5. Financial Projections

The financial projections for Kalabasa Chips were developed using a conservative model that assumes 26 days of production per month (312 days annually), starting with 100 packs per day and increasing output by 10% each year. With an initial selling price of ₱20 per pack and a corresponding 10% annual price increase, projected sales revenues steadily rise from ₱624,000 in Year 1 to ₱1,338,790 in Year 5. This growth reflects both incremental expansion in production capacity and strategic price adjustments, resulting in more than a twofold increase in annual sales over the five years, thereby demonstrating the enterprise's potential for sustainable profitability.

Financial ratios and analysis

Net profit margin (NPM) is a key indicator of the profitability of the proposed Kalabasa Chips enterprise, calculated by subtracting all business expenses from total revenue (Nariswari & Nugraha, 2020). In the first year, the NPM is projected at 5%, meaning that for every peso of sales, the business earns ₱0.05 in net profit. Over the succeeding years, profitability improves significantly, with margins rising to 16% in Year 2, 24% in Year 3, 31% in Year 4, and 37% in Year 5. Although the initial margin is relatively low, the upward trajectory demonstrates the enterprise's capacity to improve efficiency and profitability over time, supporting its financial viability and long-term sustainability.

Gross Profit Margin. Measures profitability by comparing gross profit to total sales. For the Kalabasa Chips enterprise, gross profit steadily increases from ₱368,784 in 2026 to ₱880,975.68 in 2030, while sales rise from ₱624,000 to ₱1,333,762.56. The gross profit ratio improves consistently, from 59% in 2026 to 66% in 2030, reflecting efficient cost management and growing profitability. This upward trend indicates that the business can

sustain operations, expand market reach, and strengthen financial stability over time.

Return on Investment (ROI) is a financial metric that evaluates the efficiency and performance of a company's investments by comparing the returns generated relative to the initial cost (Majka, 2024). For the proposed Kalabasa Chips enterprise, projections indicate that 30% of the initial capital outlay will be recovered within the first year of operations. Furthermore, the entire capital invested is projected to be fully recouped in just 1 year and 9 months, underscoring the business's ability to generate rapid returns and validating its financial sustainability over a reasonably short period.

Cash flows. The projected cash flow of the Kalabasa Chips enterprise from 2026 to 2030 demonstrates sustained liquidity and financial stability. Annual inflows are derived from the initial investment and steadily increasing sales revenues, while outflows cover equipment, operating costs, salaries, taxes, and other expenses. Despite rising expenditures, the business maintains a positive year-end cash balance, beginning at ₱105,572.64 in 2026 and reaching ₱1,330,217.60 by 2030. This consistent upward trend highlights the enterprise's ability to remain liquid, meet obligations, and support future growth (Laghari et al., 2023).

6. Socio-economic aspect

The socio-economic impact of the proposed Kalabasa Chips enterprise highlights its role in fostering inclusive growth and rural development in San Jose, Occidental Mindoro. By creating jobs accessible to women, youth, and barangay workers, the project enhances household incomes and community skills while providing local squash farmers with a stable market, reducing post-harvest losses, and increasing farm profitability. The owner benefits from a sustainable livelihood that transforms a common crop into a value-added product, strengthening local entrepreneurship and branding. Moreover, the government gains from increased tax revenues and alignment with livelihood and microenterprise programs of agencies such as DTI, DA, DOLE, and TESDA. Collectively, these outcomes demonstrate how the enterprise contributes to economic resilience, resource efficiency, and community empowerment, positioning Kalabasa Chips as both a profitable venture and a driver of socio-economic development.

7. SWOT and potential analysis

Strengths - The Kalabasa Chips enterprise benefits from several strong internal factors that support its viability. The abundant supply of squash in San Jose ensures a consistent source of raw materials, while market surveys reveal that 83% of consumers are willing to purchase the product within the ₱20–₱30 price range. Financial projections confirm profitability without reliance on debt, and the branding slogan "Squash Your Cravings!" reinforces local identity and community appeal, positioning the business as both sustainable and culturally relevant (Elarabi & Khalifa, 2024).

Weaknesses - Despite these advantages, the enterprise faces notable limitations. The chips have a short shelf life if not packaged in moisture-proof materials, which may affect product quality and consumer trust. Production capacity is constrained by small-scale equipment, limiting the ability to meet rising demand. Furthermore, consumer unfamiliarity with squash chips requires significant awareness-building efforts to establish market recognition and acceptance (Ekman, 2010).

Opportunities - Externally, the business is well-positioned to capitalize on favorable market conditions. Rising demand for affordable, nutritious snacks among health-conscious consumers creates strong growth potential. Marketing opportunities exist in schools, pasalubong centers, weekend markets, and online platforms, while support from LGUs, cooperatives, and DTI programs provides valuable assistance in financing and promotion. Additionally, introducing new flavors and innovative packaging can attract a broader range of buyers and strengthen market presence (Shukla et al., 2022).

Threats - The enterprise must also contend with external risks that could hinder expansion. Intense competition

from bananas, potatoes, and imported chips hinders market penetration. Fluctuating farmgate squash prices, ranging from ₱20 to ₱40 per kilo, may affect profit margins, while changing weather threatens harvest stability. Regulatory requirements, such as FDA permits and labeling, could delay entry, and shifting consumer preferences, combined with limited awareness outside San Jose, may slow broader market acceptance (Oeconomedia, 2023).

Fallback Strategies - To mitigate these risks, the enterprise has outlined proactive fallback measures. Supply chain instability will be addressed by sourcing squash from nearby towns and farmer cooperatives, while spoilage risks will be minimized through moisture-proof packaging and strict production standards. Slow market acceptance will be countered with free tasting activities, promotions, and partnerships with schools and barangays. Financial limitations will be managed by starting small and expanding gradually with support from LGUs, cooperatives, or microfinance programs. Rising farmgate prices and weather disruptions will be mitigated by diversifying suppliers and maintaining flexible production schedules. At the same time, regulatory delays can be reduced by preparing documents early, attending food safety training, and consulting with government agencies to ensure compliance (Berdegué et al., 2025).

8. Conclusions

The study confirmed that establishing a Kalabasa Chips business in San Jose, Occidental Mindoro, is feasible, financially sound, and supported by strong market potential. Results show that the enterprise is practical and financially viable, with clear opportunities in the local market. Respondents expressed genuine interest and willingness to purchase the product at a competitive price, while the abundant supply of squash in San Jose ensures sustainable production. A sole proprietorship was identified as the most suitable form of management for this small-scale enterprise, requiring only modest capital investment and achieving break-even in less than two years. Beyond profitability, the business contributes to socio-economic development by creating jobs, supporting local farmers, reducing post-harvest losses, and promoting healthier food choices. Its strategic location in San Jose further strengthens its viability, as it is close to both raw material sources and target consumers. Collectively, these findings affirm that Kalabasa Chips is not only a profitable venture but also a catalyst for community growth and innovation.

Recommendations - Based on the study's findings and conclusions, several recommendations are offered to strengthen the viability and sustainability of the Kalabasa Chips enterprise. First, the owner should organize a cluster of squash growers in San Jose to secure a consistent supply of raw materials and strengthen farm-to-processor linkages. Management is encouraged to collaborate with the Department of Agriculture and the Department of Trade and Industry to conduct market research and identify seasonal risks that may affect squash production and chip processing. To increase visibility and sales volume, a mix of marketing strategies should be adopted, including sari-sari store placements, cooperative canteen promotions, and online selling platforms. Production staff is advised to attend food safety and value-added processing seminars offered by TESDA and DOST to improve product quality and operational efficiency. After one year of successful operations, the feasibility of expanding distribution to pasalubong centers and school canteens across Occidental Mindoro should be studied. The owner is further encouraged to explore sustainability practices, such as converting squash peels and seeds into compost or animal feed to reduce waste. Finally, future researchers are recommended to investigate other aspects of squash-based enterprises, including baked chip variants, shelf-life improvement, and the impact of packaging innovations on consumer behavior.

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Influence of RA 7610 implementations on classroom management and learners' academic performance in San Jose North District

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Abstract

This study investigated the influence of teachers' classroom management practices and the implementation of Republic Act 7610 on learners' academic performance. Anchored in an integrated framework, the research examined how key dimensions of classroom management expectations, discipline, and learners' engagement interact with institutional efforts to uphold child protection by preventing abuse, eliminating discrimination, and avoiding exploitation. Using a sequential exploratory design, data were collected from 136 teachers and 136 learners to assess the level of classroom management practices, the extent of implementation of RA 7610, and students' academic performance. Findings revealed that teachers generally demonstrated effective classroom management practices, particularly in setting clear expectations, promoting active learner engagement, and maintaining appropriate disciplinary strategies. Schools were also found to have a moderate to high level of implementation of the provisions of RA 7610, indicating a growing commitment to child protection and safe learning environments. Moreover, learners' academic performance was observed to be satisfactory, with variations linked to both instructional and environmental factors. Statistical analysis indicated a significant relationship between classroom management and the implementation of RA 7610, suggesting that well-managed classrooms are often supported by strong institutional policies. Furthermore, both classroom management and the implementation of RA 7610 were found to significantly influence learners' academic performance. Based on these findings, an action plan was proposed to strengthen classroom practices and policy implementation. The study underscores the importance of a holistic approach in enhancing educational outcomes while ensuring learners' rights and well-being are protected.

Keywords: RA 7610, child protection policy, classroom management, academic performance, positive discipline, learners' welfare

Influence of RA 7610 implementations on classroom management and learners' academic performance in San Jose North District

1. Introduction

According to the 2025 data of the Philippine Statistics Authority, the Department of Social Welfare and Development served 1,967 cases of child abuse, involving 5 girls and 897 boys, in 2024, which gives us a look at the bigger picture of child abuse in the country (PSA 2025 Fact Sheet on Women and Men in the Philippines). The Philippine National Police Women and Children Protection Center (PNP WCPC) said on Friday that there have been nine reported cases of people selling babies online so far in 2026. This is more than the eight cases that were reported in all of 2025. FMA found 57 new OGBV cases between January and June 2025 by monitoring the news, speaking with survivors, and receiving reports via its email service. This number is a big jump from previous years, showing that online abuse is getting worse and that we need stronger, more gender-sensitive digital protections and better coordination between institutions (Caliwan, 2026).

Generally, people do not link child abuse to incidents occurring in educational settings. Imagining it as an action performed by an educator rather than by a parent or other family member at home challenges our traditional views. Unfortunately, the harsh reality is that many educators, despite the dignity of their role, have indeed perpetrated child abuse, be it physical, verbal, discrimination, and exploitation, and vigilance for children's well-being is also required among their colleagues (Khosravan et al., 2018). According to the Implementation of RA 7610: Special Protection of Children Against Abuse, Exploitation, and Discrimination Act, the state's policy is to protect children from all types of abuse, exploitation, and discrimination, as well as other conditions that could harm their development. It also sanctions those who commit these crimes and implements a program to prevent and deter child abuse, exploitation, and discrimination, as well as crisis intervention in such cases. When the parent, guardian, teacher, or other person with custody of the child fails to protect the child from abuse, exploitation, or discrimination, or when the child is the victim of such acts by the aforementioned parent, guardian, teacher, or other person with care and custody of the child, the state will step in on the child's behalf. Child protection policies are important tools for protecting students' rights in schools. Putting these kinds of rules in place is both the right thing to do and the law (Rabor, 2025). Teachers, parents, caregivers, administrators, and community partners must all work together to keep kids safe (Peralta & Poja, 2025). However, despite many countries having strong laws (such as the Philippines' RA 7610 and DepEd Order No. 40, s. 2012), schools still struggle to comply with them (Philippine Department of Education, 2019). The Department of Education's Child Protection Policy states that the state must care for children and ensure they are safe and treated with respect in schools. This policy is based on the 1987 Philippine Constitution, which states that children deserve to be cared for, fed, and protected from harm or mistreatment. The Department of Education's Child Protection Policy also states that schools must ensure children are treated fairly and with respect. However, competent educators are aware that a variety of factors influence students' motivation and involvement. Chen et al. (2022) highlight evidence linking academic rigor to misbehavior, noting that students who fear they cannot complete their assignments tend to become disengaged and exhibit off-task behaviors. To maintain classroom stability, teachers must be skilled at designing learning activities that account for students' differences in ability and attention span while fostering confidence through encouragement and supporting high-level cognitive development (Ahmed, 2024; Godwin et al., 2025).

The Child Protection Policy explains that schools are not just for teaching; they also have to help children grow as people. Schools should teach children to love their country, be kind to others, respect people's rights, and be people. The Department of Education Child Protection Policy shows that education is not about learning; it is also about teaching children important values and keeping them safe in school. The Department of Education Child Protection Policy is also aligned with the Convention on the Rights of the Child, which protects children from harm or mistreatment (DepEd Child Protection Policy, 2012). The Convention on the Rights of the Child states

that every child has the right to attend school and be treated equally. So, the government and schools have to make sure children can attend school, do not drop out, and behave well, all while treating them with respect and dignity. The Department of Education Child Protection Policy and the Convention on the Rights of the Child are important for keeping children safe and helping them grow. Maintaining a disciplined and compassionate educational environment is essential. Using evidence-based strategies for community safety and consistent discipline, schools should create safe, inclusive, encouraging, and equitable learning environments for every student. Section 40 of the DepEd Order (DO) No. The 2012 DepEd Child Protection Policy (CPP), a landmark document in Philippine education, provides educators with guidance in this endeavor by reiterating that any act of violence against children, exploitation, discrimination, bullying, or other abuse will not be tolerated.

Consequently, Castino (2023) said that students misbehaving in class was a problem in schools. Because of the Child Protection Policy, teachers were worried that punishing students by sending them away from school for misbehaving might break the law. This concern about students' behavior in class was also mentioned by Mag-atas & Carmona (2023), and Castino (2023) noted that one of the problems in the Philippine education system today is students' bad behavior and teachers' attempts to discipline them. Most of the time, schools do not have the resources they need to address behavioral problems. Many teachers also feel unprepared to handle all the challenges students bring to class. Students misbehaving in class and teachers trying to discipline them are issues. The Child Protection Policy makes it hard for teachers to know how to handle these situations. Schools and teachers need help to deal with these problems.

Inclusive education worldwide is something we need to consider. We have to look at the numbers to see what is going on. These numbers show us how many kids are in school and how good the education is. They also show us that there are still a lot of problems for kids who are from poor areas and kids who have disabilities. We can see that things are not getting better for these kids. The numbers from 2023 are very sad. 69 million kids are not in school, and a lot of them have disabilities (UNICEF, n.d). This is a problem because we know that only a small number of kids with disabilities are in regular schools. This means that we are not doing a job of including these kids in our schools. In some places, things are not changing fast. A lot of kids with disabilities are still in separate schools. They are not in the classrooms like other kids. This is something that we need to work on. Inclusive education is something that we need to focus on (Hayes & Bulat, 2017). We need to make sure that all kids can go to school together, no matter their abilities. Inclusive education is very important. We need to do better.

Statement of the Problem - This study aimed to explore teachers' classroom management and determine its influence, along with the implementation of RA 7610, on learners' academic performance. Specifically, it sought to answer the following questions: (1) What practices do teachers observe in managing the classroom? (2) What is the level of teachers' classroom management in terms of expectations, discipline, and learners' engagement? (3) What is the extent of the schools' implementation of RA 7610 in terms of prevention of Abuse, elimination of discrimination, and avoidance of exploitation? (4) What is the level of learners' academic performance? (5) Is there a significant relationship between the level of teachers' classroom management and the extent of schools' implementation of RA 7610? (6) Is the level of learners' academic performance significantly affected by teachers' classroom management and schools' implementation of RA 7610? (7) What action plan may be formulated to improve the teachers' classroom management, schools' implementation of RA 7610, and learners' academic performance?

Significance of the Study - This study is significant and provides valuable insights into a safer, more inclusive learning environment for learners and improved academic success. Improved focus and motivation, higher self-confidence, and effective support for individual needs. For teachers, it helps them understand how protective legislation such as RA 7610 can guide their classroom management strategies and create a safe, supportive learning environment, thereby enhancing student performance. For school administrators and principals, the study offers data-driven support for implementing child protection policies within schools and for training faculty on children's rights and positive discipline. For DepEd officials, findings can inform future amendments or reinforcements to RA 7610 and related educational policies, ensuring their effectiveness in actual classroom settings. For parents and

guardians, it raises awareness of the importance of laws protecting children in educational settings. It encourages collaborative engagement with local government units (LGUs) and community leaders to ensure student welfare. The study offers data that local government units (LGUs) can utilize to improve child protection laws and initiatives. It ensures that laws are sensitive to children's real needs. Lastly, for future researchers, the study provides a foundation for further investigation into the relationship among legal protections for children, classroom practices, and educational outcomes.

Scope and Delimitation of the Study - This research focused on the implementation of RA 7610, which addresses abuse, discrimination, and exploitation, and its influence on classroom management, including expectations, discipline, and learners' engagement and academic performance, in the San Jose North District. This research focuses on assessing the implementation of RA 7610 on teachers' classroom management and learners' academic performance in the San Jose North District, Division of Occidental Mindoro, for the SY. 2025-2026. The respondents of the study are the regular permanent teachers of the San Jose North District and learner respondents. The researcher selected 136 learners to obtain their first- and second-quarter grades. The data was gathered through interviews in the qualitative phase and a researcher-made questionnaire in the quantitative phase. The reliability test was conducted in the East, West, and Magsaysay Districts using a researcher-made questionnaire administered via an online platform. Thirty (30) respondents answered the questionnaire. The qualitative study was conducted through face-to-face interviews with 15 teacher respondents in phase 1 and 136 teachers in phase 2 for the quantitative phase in the schools of Batasan, Hilltop, La Curva, Naibuan, Pulang Lupa, San Agustin, San Isidro, Siete Central, and Yabat. Data collection was done over 60 days, from November to December 2025, allowing ample time for in-depth responses, data validation, and analysis. This mixed-methods approach ensured a comprehensive understanding of respondents' perspectives on the implementation of RA 7610 and on teachers' classroom management.

2. Methodology

Research Design - To obtain the data, the study used a sequential exploratory design. is a two-phase mixed-methods research approach that begins with a qualitative data collection and analysis phase, which then informs the subsequent quantitative phase (Creswell & Clark, 2023). Thus, in this study, a qualitative method was first used to explore responses to classroom management. The responses were used to identify the final themes for the quantitative data collection. For the second phase, a descriptive correlation design was approved. This aimed to describe the level of classroom management, schools' implementation of RA 7610, and learners' academic performance. Moreover, a correlational design was used to determine if the learners' academic performance is significantly affected by teachers' classroom management and schools' implementation of RA 7610.

Respondents of the Study - In this study, 9 schools with 10 or more teachers were included. Thus, complete enumeration was applied to cover the 136 teachers in the San Jose North District during the academic year 2025-2026. Moreover, the researcher also included 136 learners from nine (9) different schools. The learners were randomly selected to avoid bias.

Research Instrument - The study conducted the data collection through two distinct phases. The research used an interview guide during its first stage to gather information from selected participants. The second phase used a researcher-made questionnaire based on the interview and employed a 5-point Likert scale. There are two primary sections comprising the research tool. The first part comprises the extent to which elementary schools implement RA 7610 regarding abuse, discrimination, and exploitation. The second part focuses on teachers' classroom management, covering three components: classroom expectations, discipline, and student engagement. It comprises 10 statements describing all the components. Overall, the research instrument comprised 60 items that assessed respondents' level of agreement on a five-point Likert scale, a scale commonly used to measure attitudes and perceptions (Trochim et al., 2016). The verbal description of each scale is given in Table 2. The third seeks the academic performance of the 136 learners based on the first- and second-quarter grades.

To ensure the validity of the instrument as a survey questionnaire, three (3) members of the graduate school faculty from Divine Word College of San Jose, who are deemed experts in this field, assisted in checking and validating the questionnaire items. Their comments and suggestions have been incorporated into the final draft of the questionnaire. In undertaking the reliability test, thirty (30) respondents gave answers to the researcher-made instrument. The researcher ensured a one-week interval following the questionnaire's administration. After having collected the data, the inter-item consistency of the instrument was checked using the Cronbach's alpha measure. Cronbach's alpha assesses how closely related a set of items is as a group and how consistently they measure the same underlying construct in the study. Cronbach's alpha yielded the coefficients as shown in Table 1.

Table 1
Result of Reliability Analysis

Items	Number of Items	Reliability Coefficients*	Analysis
1. Abuse	10	0.890	High Reliability
2. Discrimination	10	0.793	High Reliability
3. Exploitation	10	0.742	High Reliability
4. Classroom Rules and Expectations	10	0.658	Moderate Reliability
5. Behavior Management and Discipline	10	0.701	High Reliability
6. Instructional Management and Student Engagement	10	0.788	High Reliability

*Based on equal length

Based on the results, the reliability analysis yielded generally high coefficients, although the academic exploitation indicator registered a moderate value. Coefficients ranged from 0.658 to 0.890, all of which fell below the acceptability threshold for reliability testing. This result confirms that the questionnaire was administered to the final set of respondents.

Data Gathering Procedure - To obtain the necessary data, approval/recommendations from the graduate studies panel/ministers/examiners were secured. A letter requesting to conduct this study was forwarded to the Office of the Schools Division Superintendent and Public Schools District Supervisor. Upon approval, permission to administer the questionnaire was secured from the school heads in the San Jose North District. The qualitative data collection phase was conducted face-to-face and was properly coordinated with the school principal and teachers over five days. In addition, administering the quantitative questionnaire via an online platform required close coordination with the participating school for almost two weeks. After the teacher-respondents had completed the survey, the researcher collected and tabulated the data for statistical processing. Furthermore, it took another two weeks to record and collect learners' grades.

Statistical Treatment of the Data - Descriptive and inferential statistics were applied in this study. For the qualitative part of the study, interview responses were transcribed and analyzed thematically to identify themes and insights. At the same time, the effect of RA 7610 on teaching practices was examined using online surveys. Meanwhile, learner performance was determined by taking their grades in a sample of 136 grade 6 learners. Descriptive and inferential statistics have been used for the quantitative phases of the study. Descriptive statistics included computing the weighted mean to describe the degree of teachers' classroom management, the degree of implementation of RA 7610 in schools, and the degree of learners' academic performance. Additionally, for inferential statistics, the Partial Least Squares Structural Equation Modeling (PLS-SEM) technique was employed to examine the relationships between the degree of implementation of the class and learner management and learner performance. Statistical analyses were conducted using WarpPLS version 7.0, with tests conducted at the 0.05 level.

Ethical Considerations - The research objectives were made clear to the subjects, and confidentiality was assured to protect their identities, which is why their names have not been used in this article. The research conformed to ethical standards throughout the study period. The principal of the primary school in the San Jose North District approved the collection of the required data. The purpose and procedures of the study were clearly communicated to the respondents, fostering trust and understanding. Confidentiality was prioritized, with all

collected data secured and used exclusively for the study's purpose. Participants were informed of their right to withdraw at any time without consequence. We made sure to give credit to all the researchers who helped us. The information we collected from people was used only for this study, and we took every possible measure to keep their details private. The information came from the teachers' and students' identities, which were protected by confidentiality and anonymity, with codes used in place of their names. The research followed APA guidelines for academic integrity. Our goal was to provide helpful insights for education while ensuring the safety and well-being of all participants.

3. Results and Discussions

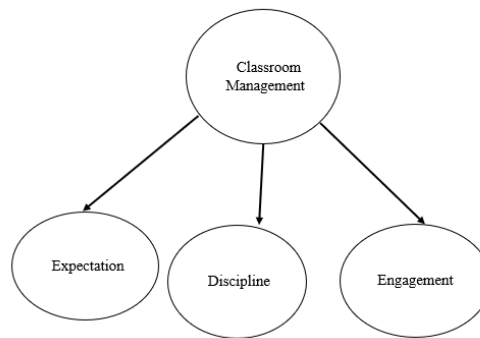


Figure 1. Final Thematic Map of Classroom Management

The final thematic map in Figure 1 reveals three key themes: expectations, discipline, and engagement. From the eleven distinct themes, three primary areas have been identified. The map illustrates a holistic approach that balances classroom management through expectations. Expectations are described when there is consistency in enforcement and classroom rules, when clear rules are established, and when learners are aware of and understand the rules. Learners are more likely to feel respected and act positively when schools and teachers respond to their behavior with respect, trust, and attention. Across the studies, teachers adjusted their teaching based on their expectations of their students. They chose different methods and materials and adjusted the pace to match each student's learning style or needs (Sieberer-Nagler, 2016). However, here is the catch: teachers did not just grade the exams—they graded them according to their own expectations. To make new skills fluent, you need to teach them directly and practice them (Lane et al., 2024). When teachers enforce rules consistently and make sure everyone understands what is expected, students know where they stand. They feel respected when teachers respond with trust and pay attention to them; it goes a long way. When schools use fair strategies, such as mixing kids with different skill levels and offering support tailored to each student, everyone gets a real shot at success (Hasanah et al., 2024). These approaches do not just change how teachers behave; they actually shape how students see themselves and what they think they can achieve (Yeager et al., 2021).

Discipline is exercised by establishing boundaries for inappropriate behavior, responding to disruptions fairly and justly, and providing constructive feedback. Students feel the most respect and are most likely to participate positively when their teachers' and schools' responses to discipline demonstrate respect, trust, and consideration for their perspectives. However, when teachers' and schools' responses to students' behavior are dismissive of students' points of view and rely solely on punitive measures, students are likely to feel disconnected from their teachers or schools (Bishop et al., 2022). Discipline policies that were allegedly designed to limit dangerous behavior via suspensions and expulsions have increasingly been applied to non-dangerous student behaviors (Jones et al., 2018; Camacho et al., 2024). Engagement refers to clarity of directions and transitions between activities, preparation and class planning, time management during teaching and learning, and the promotion of active involvement. Clarity of directions and transition between activities, preparation and class planning, time management during teaching and learning, and promotion of active involvement. Apart from understanding the techniques that promote student engagement, it is equally crucial to learn the classroom behaviors that lead to low engagement and to avoid them. The demotivating teaching behaviors are also termed “the dark side” of SDT and

have recently appeared on researchers' radar screens (Amerstorfer & Frein von Münster-Kistner, 2021). Among other demotivating teaching practices that inhibit particular needs under SDT, control (inhibiting autonomy), chaos (inhibiting competence), and cold teaching (inhibiting relatedness) have been considered. Further, certain teacher-student behavioral patterns that occur during a lesson may help one grasp the interaction between teachers' and students' motivational factors. Thus, according to Cents-Boonstra et al. (2022), positive correlations were observed between motivating teaching and student engagement at the very beginning of lessons.

The assessment of the respondents' classroom management, as shown in Table 2, reveals an overall mean of 4.83, which falls within the very high category. This indicates a robust proficiency in classroom management across all indicators. In addition, teachers are perceived to use a blend of empathy, clear structure, and engaging pedagogy to maintain an optimal learning climate. The consistency between behavior management and instructional management, both at 4.85, underscores the theory that well-managed instructions lead to well-managed behavior. As noted by Gage & MacSuga-Gage (2017), teachers who were rated highly are not just managing a room but a complex social and academic ecosystem. With a composite mean of 4.80 in expectations, the findings indicate that teachers are highly effective in establishing clear boundaries. Clear expectations are the basis of a predictable learning environment. According to recent studies by Lane et al. (2024) and Wilkins et al. (2023), proactive classroom management, where rules are explicitly taught and consistently reinforced, drastically reduces the need for reactive discipline.

Classroom discipline yielded a mean of 4.85, indicating a strong ability to maintain order and address disruptions. A very high level in behavior management, as supported by Bear et al. (2022), often indicates that teachers are focusing on self-regulation and relationship-building rather than mere compliance. This approach fosters a sense of safety and belonging, which is critical for student mental health in the post-pandemic classroom. Regarding students' engagement, the mean of 4.85 indicates that respondents can synchronize the flow of instruction with student involvement. Recent research by Li and Xue (2023) and Nisar et al. (2019) emphasizes that classroom management is inseparable from instructional quality. The results suggest that teachers are likely employing active learning strategies and digital tools effectively to keep learners focused and motivated throughout the lesson.

Table 2
Mean Level of the Respondents' Classroom Management in terms of Classroom Expectations, Discipline, and Students' Engagement

Classroom Expectations	Weighted Mean	Interpretation
1. Students show respect for their teachers and classmates.	4.74	Very High
2. Classrooms are well-organized and conducive to learning.	4.72	Very High
3. Teachers give credit to others who give better ideas.	4.85	Very High
4. Teachers maintain consistent routines throughout the day.	4.84	Very High
5. Teachers establish clear classroom rules and expectations.	4.82	Very High
6. Students follow instructions carefully.	4.82	Very High
7. Students follow classroom procedures without constant reminders.	4.81	Very High
8. Teachers build positive relationships with their students.	4.86	Very High
9. Teachers address disruptive behavior immediately and appropriately.	4.78	Very High
10. Classroom transitions happen smoothly and quickly.	4.81	Very High
Composite Mean	4.80	Very High
Discipline		
1. The teacher treats all students equally when enforcing discipline rules.	4.85	Very High
2. The teacher uses warnings before applying serious disciplinary measures.	4.82	Very High
3. The teacher communicates with my parents/guardians when I have behavioral issues.	4.79	Very High
4. I feel respected when my teacher addresses my misbehavior	4.87	Very High
5. Discipline in the classroom focuses on helping students learn from their mistakes.	4.83	Very High
6. The current discipline system in my classroom is effective in promoting good behavior.	4.86	Very High
7. Students are treated with respect even when being disciplined	4.85	Very High

8. Individual student needs are considered when addressing behavioral issues	4.90	Very High
9. Students understand the reasons behind classroom rules upon class start.	4.86	Very High
10. Teachers recognize and acknowledge when students demonstrate good behavior.	4.86	Very High
Composite Mean	4.85	Very High
Students' Engagement	4.30	Very High
1. The teacher clearly explains learning objectives at the beginning of each lesson	4.82	Very High
2. Classroom rules and procedures are consistently enforced	4.77	Very High
3. The teacher uses various teaching methods to keep students interested	4.85	Very High
4. Students receive timely and helpful feedback on their work	4.90	Very High
5. Students actively participate in class discussions that enhance their overall development.	4.81	Very High
6. Students demonstrate passion, curiosity, eagerness for acquiring new knowledge, enthusiasm, and interest in learning	4.91	Very High
7. Students ask questions and seek help when they do not understand	4.83	Very High
8. Students seek clarification whenever concepts are not clear to me.	4.93	Very High
9. The classroom environment supports collaborative learning among students	4.89	Very High
10. Students demonstrate persistence when working on challenging tasks	4.82	Very High
Composite Mean	4.85	Very High
Overall Mean	4.83	Very High

Scale: 4.20-5.00 Very High; 3.40 -4.19 High; 2.60-3.39 Moderate; 1.80-2.59 Low; 1.00-1.79 Very Low

Table 3

Mean Extent of the School's Implementation of RA 7610 in terms of Prevention of Abuse, Elimination of Discrimination and Avoidance of Exploitation

Prevention of Abuse	Weighted Mean	Interpretation
1. The school has a guidance counselor who settles cases of bullying	4.81	Very Great Extent
2. The advisers usually explained the punishment for bullying	4.64	Very Great Extent
3. The teacher's action regarding the abuse of words is clearly addressed	4.81	Very Great Extent
4. The teachers took immediate action on inappropriate words and actions by the students	4.85	Very Great Extent
5. The teachers are open to dialogue about the bullying issue.	4.87	Very Great Extent
6. Teachers always see to it that bullying is avoided.	4.79	Very Great Extent
7. The teachers made a way to have a conversation with both parties involved in bullying.	4.79	Very Great Extent
8. The school has a campaign drive about abuse awareness in school	4.75	Very Great Extent
9. The school has a firm decision on the policy regarding the bullying issue	4.85	Very Great Extent
10. The school clearly and properly disseminates the policy about child abuse.	4.87	Very Great Extent
Composite Mean	4.80	Very Great Extent
Elimination of Discrimination		
1. Teachers promote an inclusive environment and protect students with special needs from discrimination.	4.78	Very Great Extent
2. Students are not judged by their family background.	4.67	Very Great Extent
3. Everyone is given equal opportunities to join school activities.	4.86	Very Great Extent
4. Students of different religions or beliefs are respected.	4.79	Very Great Extent
5. No one is left out because of their physical appearance.	4.93	Very Great Extent
6. Teachers stop classmates who make fun of others.	4.80	Very Great Extent
7. School rules are applied equally to all students.	4.79	Very Great Extent
8. Our school promotes respect for different cultures and traditions.	4.77	Very Great Extent
9. Students feel safe to express their identity (e.g., language, culture, interests).	4.79	Very Great Extent
10. Discrimination cases are addressed quickly and fairly by the school.	4.83	Very Great Extent
Composite Mean	4.80	Very Great Extent
Avoidance of Exploitation		
1. The school takes action to prevent exploitation of students.	4.73	Very Great Extent
2. The school resources are used fairly for student welfare.	4.70	Very Great Extent
3. Victims of exploitation are afraid to seek help due to threats or trauma.	4.79	Very Great Extent
4. Teachers give warnings about inappropriate online content and advertising.	4.80	Very Great Extent
5. Teachers advised students to feel safe from child exploitation.	4.82	Very Great Extent
6. Teachers are vigilant of children who show signs of fear, anxiety, and withdrawal.	4.81	Very Great Extent
7. The teachers clearly discuss sexual exploitation to prevent exploitation.	4.76	Very Great Extent
8. School has a specialized trauma-informed care and support team.	4.88	Very Great Extent

9. Sometimes, children with impairments are not given the assistance and education they need.	4.82	Very Great Extent
10. Children who are exploited physically are at higher risk of developmental delays.	4.68	Very Great Extent
Composite Mean	4.78	Very Great Extent

Scale: : 4.20-5.00 Very Great Extent; 3.40 -4.19 Great Extent; 2.60-3.39 Moderate Extent; 1.80-2.59 Low Extent; 1.00-1.79 Very Low Extent

Table 3 shows the mean extent of the school's implementation of RA 7610 in terms of preventing abuse, eliminating discrimination, and avoiding exploitation. Data reveals that the schools have achieved a very high level of compliance with RA 7610. Both indicators of abuse and discrimination received the highest composite mean of 4.80, closely followed by 4.78. The schools recorded an overall mean of 4.79, signifying that they implement the child protection mandates to a great extent. These results indicate that the schools have successfully institutionalized child protection protocols. A mean of 4.79 suggests that policies regarding the prevention of child abuse, discrimination, and exploitation are not merely present on paper but are actively practiced and integrated into the schools' culture. Moreover, the very high level of implementation indicates that school personnel are well trained and tasked with identifying red flags and following reporting procedures. The very high rating in discrimination implies an inclusive environment where students are protected regardless of their background. In abuse prevention, it reflects a safe physical and emotional space for learners (Rabor, 2025). The strict implementation of RA7610 in Philippine schools fulfills the Doctrine of Parentis Patriae, according to Monterona (2016), in which the state acts as the guardian of children's rights, and reflects the school's commitment to the DepEd Child Protection Policy. A report by UNESCO (2019) also noted that schools that achieve the highest tier of anti-discrimination policy implementation often foster stronger social cohesion. By addressing discrimination, the schools align with global standards of inclusive education, ensuring that every child feels a sense of belonging.

Table 4
Distribution of the Learners' Academic Performance Based on the First and Second Quarter Grades

Grades	First Quarter		Second Quarter	
	Frequency	Percent	Frequency	Percent
75 – 79	37	27.2	27	19.9
80 – 84	55	40.4	64	47.1
85 – 89	26	19.1	21	15.4
90 – 94	17	12.5	21	15.4
95 – 100	1	.7	3	2.2
Total	136	100.0	136	100.0

The academic performance of the 136 learners was evaluated using their frequency distribution and percentages across two quarters, as shown in Table 4. In the first quarter, the majority of the learners fell within the 80-84 grade bracket, representing 40.4% (n=55) of the total sample. A significant portion of the class, 27.2%, performed within the 75-79 range. Only one student (0.7%) achieved a grade in the highest bracket of 95-100. The movement of 10 students out of the lowest bracket (75-79) is a key indicator that remedial or instructional efforts were successful. The second-quarter performance showed a noticeable shift in the grade distribution. While the 80-84 bracket remained the highest at 47.1%, there was a significant reduction in students scoring in the lowest bracket, 75-79, from 27.2% to 19.9%. Conversely, the number of high achievers increased as learners in the 90-94 range rose from 12.5% to 15.4%, and those in the 95-100 bracket tripled from 1 to 3 students (2.2%). The improvement in the second quarter may be attributed to the washback effect of the first-quarter assessment, as presented in Ilie's (2024) recent research. The research emphasized that effective feedback catalyzes enhancing student achievement, helping learners identify specific weaknesses and adjust their study strategies accordingly. By receiving grades in the first quarter, students may have developed stronger metacognitive skills for monitoring their learning progress, as revealed by Rickey et al. (2025). The upward shift in the 80-84 and 90-100 brackets reflects academic resilience, as mentioned in the study of Carroza-Pacheco et al. (2025). It stated that students in secondary education often demonstrate the ability to recover from initial academic setback through improved coping strategies and persistent effort. This transition often aligns with students becoming more familiar with the teacher's instructional style. The improvement of the learners' grades may be attributed to some instructional

interventions. The findings of Sari et al. (2025) indicated that the use of contextualized learning resources and active teaching strategies significantly improved performance in subsequent grading periods.

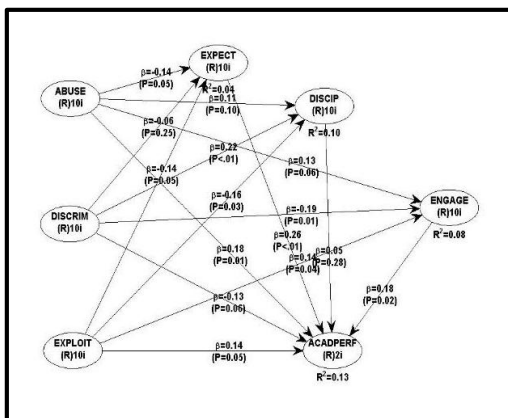


Figure 2. Structural Model of the Relationship Between the Schools’ RA 7610 Implementation and Teachers’ Classroom Management, Schools’ RA 7610 Implementation and Academic Performance, and Schools’ RA 7610 Implementation and Teachers’ Classroom Management

The structural model diagram displayed in Figure 9 indicates the hypothesized relationship between the level of schools’ RA 7610 implementation and the level of teachers’ classroom management, between the level of schools’ RA 7610 implementation and students’ academic performance, and between the level of schools’ RA 7610 implementation and teachers’ classroom management. Results have been generated using WarpPLS version 7.0, applying Structural Equation Modeling (SEM) with the Partial Least Squares (PLS) method, and are anchored at the 0.05 level of significance. The model includes three exogenous (predictor) variables at the RA 7610 implementation level, with descriptors for abuse, discrimination (DISCRIM), and exploitation (EXPLOIT). The intervening variable, classroom management, is described by classroom rules and expectations (EXPECT), behavior management and discipline (DISCIP), and instructional management and students’ engagement (ENGAGE), all of which are derived from a 10-item scale. The endogenous variable, academic performance (ACADPERF), is derived from the first two quarterly grades of learners. The paths represent the direct causal relationships proposed by the model, with the beta values indicating the strength and direction of the relationships and the R² values ranging from 0.04 to 0.13, indicating the proportion of variance in the endogenous variable, academic performance, explained by the predictors. The R² values are relatively low, suggesting that combined variables explain only a small to moderate amount of variability in the outcome variables.

Table 5
Beta Coefficients of the Paths and p-values for H₀

Paths	Beta (β) Coefficient	p-value*	Interpretation
Ho1: RA 7610 Implementation→Classroom Management			
ABUSE→EXPECT	-0.140	0.047	Significant
ABUSE→DISCIP	0.108	0.100	Not Significant
ABUSE→ENGAGE	0.130	0.060	Not Significant
DISCRIM→EXPECT	-0.057	0.253	Not Significant
DISCRIM→DISCIP	0.216	0.004	Significant
DISCRIM→ENGAGE	-0.192	0.010	Significant
EXPLOIT→EXPECT	-0.138	0.050	Not Significant
EXPLOIT→DISCIP	-0.160	0.027	Significant
EXPLOIT→ENGAGE	0.143	0.044	Significant
Ho2: RA 7610 Implementation→Academic Performance			
ABUSE→ACADPERF	0.182	0.014	Significant
DISCRIM→ACADPERF	-0.128	0.064	Not Significant
EXPLOIT→ACADPERF	0.138	0.050	Not Significant
Ho3: Classroom Management→Academic Performance			
EXPECT→ACADPERF	0.261	<0.001	Highly Significant
DISCIP→ACADPERF	0.051	0.276	Not Significant
ENGAGE→ACADPERF	0.175	0.018	Significant

*Significant at p < 0.05

The path analysis in Table 5 reveals the complex interplay between legal protections for children and education outcomes. The results of the first test of the hypothesis (Ho1) registered relatively low beta (β) coefficients ranging from -0.057 to 0.216. The results indicate that specific components of child protection, abuse, discrimination, and exploitation have varying impacts on classroom management strategies. A negative impact of adverse experiences on abuse, discrimination, and exploitation is reflected in the table. Abuse, discrimination, and exploitation reveal a direct and significant negative effect on classroom rules and expectations, instructional management and students' engagement, and behavior management and discipline, in that order. This suggests that negative experiences detract from students' belief in classroom expectations. Moreover, as awareness of or instances of abuse-related protocols increase, teacher expectations may appear more constrained. Surprisingly, the role of discipline is positively associated with discrimination and holds to the correlation between instructional management and students' engagement and exploitation. A probable explanation for this positive correlation in marginalized or victimized populations is that students adopt discipline as a coping mechanism. Students who experience discrimination or exploitation may internalize a drive to succeed to counter negative stereotypes.

The findings suggest that child protection policies are active variables in classroom dynamics. In fact, according to Garcia-Rodriguez (2026), a safe environment, free from threat of abuse or discrimination, is the foundation upon which effective classroom management is built. When teachers prioritize the anti-discrimination aspects of RA 7610, it creates a structured environment that directly influences student discipline and involvement. The path coefficients for RA 7610 implementation correlated with academic performance were low, at -0.128 and 0.182. Only the perception of abuse prevention influenced academic performance; however, discrimination and exploitation did not reach statistical significance. While the school becomes a safer environment than their home life, students may pour their energy into academic tasks to maximize their time away from an abusive environment. The significant link between abuse prevention and academic performance underscores the safety-first model of learning, with UNESCO (2023) emphasizing that child protection policies are essential for academic success. When students feel physically and emotionally secure, their capacity for memory retention and executive functioning increases (Latino et al., 2025).

Classroom rules and expectations had a highly significant positive effect on students' academic performance. Instructional management and students' engagement also exerted their significant influence on academic performance. The high significance of expectations confirms that teacher efficacy and high standards are primary drivers of student success. This aligns with Hattie's (2023) updated synthesis of visible learning, in which teacher expectations rank among the top influences on student achievement. Furthermore, the role of engagement aligns with the findings of Fredricks et al. (2004), as cited by Graham et al. (2023), who argue that behavioral and emotional engagement are the psychological precursors to academic mastery. Engagement is multidimensional, covering behavioral, emotional, and cognitive domains, and its connection to academic performance aligns with Fredricks' conclusion that active participation is a reliable predictor of grade-point average or test scores. The above findings support rejecting the null hypothesis that there is no significant relationship between the exogenous and endogenous variables. Hence, the data suggest that while the implementation of RA 7610 directly influences academic performance through abuse prevention, its greater effect is mediated by classroom management. By creating a non-discriminatory and safe environment, the policy allows high expectations and student engagement to flourish, which are considered catalysts for academic excellence (Obah, 2024).

There are seven links in the structural model that were found to be non-significant; thus, an emerging model is generated. This new model, as displayed in Figure 3, reflects only the significant links between the exogenous variables and the endogenous variable. In support of the hypothesis test results, the standardized path estimates, effect sizes, and standard errors are presented in Table 5. The beta coefficients show a slight increase, reflecting the correlation between the variables, compared to the structural model, and the p-values indicate a significant effect on academic performance.

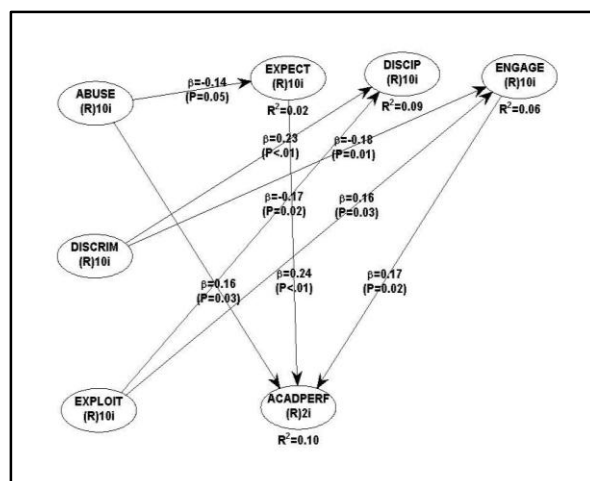


Figure 3. The Emerging Model of the Relationship Between Schools’ RA 7610 Implementation and Teachers’ Classroom Management, Schools’ RA 7610 Implementation and Academic Performance, and Schools’ RA 7610 Implementation and Teachers’ Classroom Management.

Table 6

Standardized Estimates of the Path in the Emerging Model

Hypothesis	Standardized Estimates (β)	Standard Error	p-value*	Effect Coefficient**	Effect Size
Ho ₁ : RA 7610 Implementation→Classroom Management					
ABUSE→EXPECT	-0.141	0.083	0.046	0.020	Small
DISCRIM→DISCIP	0.232	0.081	0.003	0.058	Small
DISCRIM→ENGAGE	-0.182	0.082	0.014	0.034	Small
EXPLOIT→DISCIP	-0.166	0.082	0.023	0.032	Small
EXPLOIT→ENGAGE	0.162	0.083	0.026	0.027	Small
Ho ₂ : RA 7610 Implementation→Academic Performance					
ABUSE→ACADPERF	0.162	0.083	0.026	0.024	Small
Ho ₃ : Classroom Management→Academic Performance					
EXPECT→ACADPERF	0.238	0.081	0.002	0.054	Small
ENGAGE→ACADPERF	0.171	0.082	0.020	0.023	Small

*Significant at p ≤ 0.05

**Effect size coefficient: 0.02 – small, 0.15 – medium, 0.30 – large

Table 6 presents the standardized path estimates in the emerging model, obtained from path analysis or structural equation modeling (SEM). Since these are standardized, the magnitude can be directly compared across different paths. For the first hypothesis, a negative relationship exists in the path, Abuse and Expectation, suggesting that as awareness or reporting of abuse increases, teacher expectations might decrease, potentially due to the psychological burden on both learners and teachers. This negative path suggests a cautionary effect, as emphasized by Asak et al. (2023), whereby teachers might reduce academic pressure to avoid inadvertently crossing into behaviors perceived as psychological abuse under the law. The findings argued that when child protection is standardized, it reduces classroom volatility. Other paths also demonstrated negative effects, such as in "Discrim to Engage" and "Exploit to Discipline."

On the other hand, a strong positive path in the model is reflected in Discrim and Discip. It suggests that as awareness and implementation of anti-discrimination policies increase, teachers adopt more structured and fair disciplinary measures. The significant relationship between RA 7610, the anti-discrimination policy, and classroom discipline aligns with De Leon et al. (2026), who found that legal literacy among Filipino teachers promotes a shift toward positive discipline. In addition, a recent study by Khanbashi (2024) emphasized that proactive discipline is a hallmark of effective management. Another path recording a positive effect is on EExploit-to-Engage. This implies that protecting students from exploitation, such as ensuring they are not overburdened or unfairly treated, would significantly increase their classroom engagement. The second hypothesis test yielded a

low standardized estimate for the path from Abuse to AcadPerf, indicating that protecting children from abuse has a direct, positive impact on academic performance. This aligns with UNESCO's Child 21 Framework (2025), which posits that a child's survival and development serve as prerequisites for learning. In other words, the child's safety is a non-negotiable prerequisite for cognitive development.

The third hypothesis test examined how classroom management indicators relate to academic performance. Both tested paths, Expect to AcadPerf and Engage to AcadPerf, show a positive relationship. This is consistent with findings that higher expectations and greater engagement lead to better academic performance, although both paths have a small effect size (0.053 and 0.023). While effect sizes are small, in educational settings, according to Gage & MacSuga-Gage (2017), even small improvements in safety and management can lead to meaningful long-term gains for marginalized learners. The result is consistent with Marzano's (2023) study, underscoring that high teacher expectations can improve achievement scores by significant margins. Consistent with the findings, active student engagement is viewed as a primary driver of higher grades and better test outcomes. High expectations are the most effective management behavior for boosting academic grades. All tested paths are statistically significant, indicating that the null hypotheses are rejected for these paths. However, the observed relationships have a small effect (0.020 to 0.058). In the meta-analysis by Korpershoek et al. (2025), the authors noted that although the effect size of safety policies on grades is often small, safety policies are a foundational variable. This indicates that without the sense of safety provided by anti-abuse policies, more direct pedagogical interventions often fail. While the variables are related, their practical impact on the variance in the outcome variable, academic performance, is minor. Moreover, standard error values of 0.081 to 0.083 are very low, indicating the accuracy of the samples in relation to the conclusions drawn about the overall respondent population. The findings above confirm a cascading effect of the proper implementation of RA 7610, creating a safer, non-discriminatory environment that facilitates better classroom management and ultimately improves academic performance.

Table 7

Action plan to improve the implementation of RA 7610 in teachers' classroom management and students' academic performance

Program Title	Goal	Action Steps	Budget (PHP) Time Framed	Responsible Person(s)	Expected Outcome
Enhanced Classroom Management Program (ECMP)	To improve teachers' classroom management skills for better student engagement and discipline	<ul style="list-style-type: none"> • Conduct seminars/workshops on classroom management • Organize LAC sessions and peer mentoring <ul style="list-style-type: none"> • Classroom observations and feedback • Provide instructional materials 	5,000 July - March	School Head, Master Teachers, Teachers	Improved classroom environment; increased student engagement and reduced misbehavior
RA 7610 Child Protection Implementation Program	To strengthen awareness and proper implementation of child protection policies in schools	<ul style="list-style-type: none"> • Conduct orientation on RA 7610 • Establish Child Protection Committee • Develop reporting system for violations • Post child protection policies in school 	5,000 August –March	School Head, Guidance Counselor, Child Protection Committee	Increased awareness of child rights; safer and child-friendly school environment
Academic Performance Enhancement Program (APEP)	To improve learners' academic performance through targeted interventions	<ul style="list-style-type: none"> • Conduct diagnostic and formative assessments • Implement remedial and enrichment classes • Use differentiated instruction strategies 	5,000 July- February	Teachers, Master Teachers, School Head	Improved academic performance; increased mastery of competencies

		<ul style="list-style-type: none"> • Provide learning materials and modules 			
Positive Discipline and Student Engagement Program	To promote positive behavior and active participation among learners	<ul style="list-style-type: none"> • Implement positive discipline strategies • Conduct interactive and collaborative activities • Recognition and reward system 	5,000 August – February	Teachers, Guidance Counselor, School Head	Improved learner behavior; increased motivation and participation
		<ul style="list-style-type: none"> • Provide guidance and counseling sessions 			
Monitoring, Evaluation, and Feedback Program	To ensure the continuous improvement of implemented programs	<ul style="list-style-type: none"> • Conduct regular classroom observations • Gather feedback from students and teachers • Analyze academic performance data • Quarterly review and adjustment of plans 	5,000 July - February	School Head, Master Teachers, Research Coordinator	Data-driven decisions; sustained improvement in teaching and learning outcomes

Table 7 presents a comprehensive action plan specifically designed to bridge the gap between the mandates of RA 7610 and their practical application within the classroom. This strategic roadmap is built upon four interconnected programs that aim to refine both teacher management styles and student academic outcomes. Central to this plan is the RA 7610 Child Protection Implementation Program, which serves as an advocacy tool to foster a deeper understanding of child safety and transform the school into a genuine sanctuary for learners. To ensure this safety translates into classroom success, the Academic Performance Enhancement Program introduces tailored teaching methods designed to meet diverse student needs. At the same time, the Discipline and Learner Engagement Program focuses on cultivating positive behavior through active participation rather than punitive measures. A dedicated monitoring and evaluation system sustains the effectiveness of these initiatives, and a feedback program that establishes a necessary cycle of assessment and refinement. By continuously checking the progress of these interventions, school administrators can identify successful strategies and address areas requiring improvement (Wang et al., 2025). The study ultimately emphasizes that for the DepEd Child Protection Policy to be truly transformative, it must move beyond simple compliance. This is especially true for private institutions, where there is an urgent need to verify that teachers have the logistical support and resources necessary to implement these protections. According to Regidor et al. (2024), prioritizing these systemic supports is the only way to ensure that the law effectively creates a supportive, high-performing environment for every student.

4. Conclusions

Based on the summary of the findings presented above, the following conclusions were drawn. The teachers in the San Jose North District exhibit highly effective classroom management practices, including clear expectations, discipline, and student engagement. To create a happy, orderly, and productive learning environment, it is essential to incorporate expectations, discipline, and learners' engagement. Teachers can lessen interruptions and improve student focus by proactively defining behavioral norms, using constructive sanctions, and actively involving students. As a result, these integrated strategies are crucial for creating a nurturing environment that immediately enhances students' academic performance. The teachers at San Jose North District demonstrated a high level of classroom management skills, particularly in their expectations, discipline, and learners' engagement. Teachers' clear expectations and established classroom rules play a vital role in effective classroom management, as they guide students' behavior, clarify expectations, and help maintain focus and order in the learning environment. Also, fair and consistent classroom management is essential in promoting a positive learning environment, as it not only reduces disruptions but also helps students develop important life skills such as self-discipline, responsibility, and respect, ultimately supporting their academic success and personal growth. Teachers

are really good at getting students involved and excited about learning. They use many methods to teach that keep students interested and encourage participation. When students are really into what they are learning, they behave better and do better in school. This is important because it shows that teachers are doing a job of managing their classrooms and helping students learn. Teachers are doing a job of getting students engaged in the learning process, and this is a big part of having a classroom that works well. The teachers are successful because they find ways to make learning fun and interesting for the students. The schools in the San Jose North District demonstrated a high level of implementation of RA 7610 to prevent abuses, discrimination, and exploitation. This shows that these schools are highly committed to abiding by child protection policies. The implementation of RA 7610 in these schools shows a safe environment for children to learn, which is significant for their development. Classroom management and the implementation of RA 7610 significantly affect learners' academic performance. This finding serves as a strong call to action for all educational institutions to sustain and further strengthen their abuse prevention initiatives, recognizing that the protection of every child is not just a legal obligation but a profound moral responsibility that must never be compromised. It was determined that there was a very high level of implementation aimed at eradicating discrimination. Regardless of a child's ethnicity, gender, religion, socioeconomic status, or background, this study clearly demonstrates the schools' strong commitment to establishing inclusive, equitable, and respectful learning environments. This outcome clearly shows that schools have made significant and notable strides toward eradicating discriminatory attitudes and actions in their local communities. Schools are doing a job in keeping children safe from all kinds of exploitation. They have put in place measures to monitor the situation loosely and have strong programs that speak out against exploitation. This shows that the school community really cares about protecting children from harm and supporting their well-being. They support every child's rights. Schools are committed to shielding children and championing their dignity.

The results indicate that the learners' academic performance was satisfactory to high. This suggests that most learners are performing favorably academically. This indicates that the learning environment and processes are positively influencing learners' academic performance. The teachers' skill in managing the classroom is significantly related to the implementation of RA 7610 in schools, underscoring the importance of effective classroom management in promoting a safe and protective environment. The academic performance of the learners is greatly influenced by the teachers' competence in classroom management and the school's compliance with RA 7610, thereby emphasizing the role of an organized environment in learners' academic success. An action plan was proposed to enhance classroom management, strengthen the implementation of RA 7610, and improve learners' academic performance.

Recommendations - In view of the findings and conclusions of this study, the following recommendations are made: School heads, in coordination with various agencies, may continue to provide training and seminars for teachers on classroom management and the implementation of RA 7610. The level of teachers' classroom management may be further enhanced through specific interventions: Teachers may be supported in establishing clear, consistent, and achievable expectations developed in collaboration with learners to promote greater accountability. The institutionalization of positive discipline can be enhanced through teacher training and mentoring, helping ensure fairness and respect in discipline. Teachers may use a range of student-centered activities, such as project work, role-plays, and concept mapping, alongside technology to sustain higher levels of engagement. The level of implementation of RA 7610 by schools may be enhanced through the following targeted interventions: schools may develop and institutionalize confidential reporting mechanisms and prompt-response systems, with regular orientations for teachers, learners, and parents on how to identify and prevent abusive behaviors. Inclusive education programs in schools may be developed to highlight the importance of equity, diversity, and respect for learners from different backgrounds, with monitoring of classroom practices to ensure non-discriminatory treatment in grading, participation, and opportunities. Monitoring and evaluation can be conducted regularly using qualitative and quantitative methods. The academic performance of learners, which is significantly affected by teachers' classroom management and the implementation of RA 7610, can be sustained by aligning instructional strategies with the school's child protection policies. Teachers' classroom management can be continually improved to enhance learners' academic performance sustainably. Child protection policies can

be strictly implemented in schools to enhance learners' academic performance sustainably. An action plan can be developed and implemented to enhance teachers' classroom management sustainably, the implementation of RA 7610, and learners' academic performance. This can be done with the involvement of all stakeholders, which includes DepEd, the school, teachers, parents, learners, the local government, and future researchers.

Clear policies against child labor and exploitation may be developed and institutionalized, with the support of local government units and non-government organizations that ensure the welfare of learners inside and outside the school. Learners' academic performance may be enhanced through targeted academic support programs, such as tutorials, mentoring, and enrichment activities. Differentiated instruction may be implemented, and socio-emotional learning may be integrated to enhance learners' strengths, motivation, and self-regulation. Future researchers may also include the level of understanding of RA 7610 among both teachers and learners, as this will serve as baseline data to assess the law's influence.

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Foundational reading literacy and proficiency of indigenous learners in Magsaysay, Occidental Mindoro

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Abstract

This study aimed to determine the foundational reading literacy factors affecting the reading proficiency of Grades 1 to 6 Indigenous learners in Magsaysay, Occidental Mindoro. This study employed an exploratory sequential design. The first stage involved collecting qualitative data through interviews conducted with fifteen teachers from grades 1 to 6 at the IP Schools of Rizal and Calintaan. The second stage involved collecting quantitative data through survey questionnaires from seventy (70) grades 1 to 6 teachers of the twelve IP schools in Magsaysay, Occidental Mindoro. Qualitative analysis revealed four foundational reading literacy factors: language of instruction alignment, teachers' preparation and practice, home/community literacy environment, and learners' readiness. Quantitative analysis demonstrated that language of instruction alignment and teachers' preparation and practice are extensively evident and consistently practiced by teachers, with Language of Instruction Alignment having the highest composite mean. This study also revealed that teachers' preparation and language of instruction alignment both have a significant effect on reading fluency. At the same time, learners' readiness shows a positive and significant relationship with reading comprehension. However, the home/community literacy environment and its effect on reading fluency were not significant. To address the areas needing improvement and support, the District Office and school principals may adopt a unified reading framework that integrates language alignment, teacher competence, community engagement, and learner readiness. The SAMA-SAMA SA PAGBASA may also be implemented as a district-based capacity-building initiative in Magsaysay District and may also be adopted by other districts as a model program to enhance the reading proficiency of IP learners.

Keywords: foundational reading literacy factors, reading proficiency, IP Learners, instructional alignment; literacy environment

Foundational reading literacy and proficiency of indigenous learners in Magsaysay, Occidental Mindoro

1. Introduction

Reading proficiency is widely recognized as the foundation of all learning. In the elementary years of schooling, particularly from Grades 1 to 6, the ability to read with comprehension significantly determines learners' academic success across all subject areas. The Department of Education (DepEd) underscores the importance of strengthening early literacy through programs such as Every Child a Reader Program (ECARP), which aims to ensure that every learner becomes a proficient reader, particularly by the end of Grade 3 (DepEd Order No. 18, s. 2017). In addition, reading performance is regularly monitored through assessment tools such as the Philippine Informal Reading Inventory (Phil-IRI), which provides baseline and progress data on learners' reading levels (DepEd, 2018). Furthermore, the Department of Education has strengthened its literacy initiatives through the implementation of rapid assessment tools such as the Comprehensive Rapid Literacy Assessment (CRLA), which serves as a diagnostic tool designed to quickly measure learners' reading abilities in terms of fluency and comprehension. Its administration is often aligned with DepEd's policy on early literacy assessment and intervention under the K to 12 Basic Education Program and the Early Language, Literacy, and Numeracy (ELLN) initiatives (DepEd, 2015, 2016).

For Indigenous Peoples (IP) learners, however, achieving reading proficiency presents unique challenges. In the study of Alicante and Pontillas (2025), it was revealed that Grade 3 IP pupils generally attained satisfactory proficiency in phonics, phonological awareness, vocabulary, and comprehension, though fluency remained a persistent challenge. Meanwhile, the study of Leano et al. (2019) revealed weaknesses in alphabet knowledge, phonics, and phonological awareness, such as challenges in arranging words alphabetically, recognizing rhymes, and segmenting sounds. In connection with these findings, Lumayas and Brazil (2025) demonstrate the motivational impact of culturally grounded instruction to bridge cultural gaps and support literacy development.

In the Philippines, the Department of Education (DepEd) emphasizes the importance of developing functional literacy among all learners, including those in IP schools, in line with the K to 12 curriculum and the Indigenous Peoples Education (IPEd) Program. Anchored on these policies and educational realities, this study, entitled "Foundational Reading Literacy and Reading Proficiency of Indigenous Learners in Magsaysay, Occidental Mindoro," aimed to investigate the foundational reading literacy factors influencing the reading proficiency of Indigenous learners in Grades 1 to 6 in the 12 IP schools in Magsaysay, Occidental Mindoro. The study utilized data from the Comprehensive Reading and Literacy Assessment (CRLA) and the Philippine Informal Reading Inventory (Phil-IRI) to determine learners' reading proficiency in terms of fluency and comprehension. Furthermore, it examined how key factors—such as language of instruction alignment, teachers' preparation and practice, home and community literacy environment, and learners' readiness affect reading outcomes, based on the perspectives of Grades 1 to 6 teacher-respondents.

Statement of the Problem - This study aimed to determine the foundational reading literacy factors affecting the reading proficiency of grades 1 to 6 Indigenous learners in Magsaysay, Occidental Mindoro. Specifically, the study sought answers to the following questions: (1) What are the foundational reading literacy factors of IP learners? (2) What is the extent of the foundational reading literacy factors of IP learners in terms of language of instruction alignment, teachers' preparation and practice, home/community literacy environment, and learners' readiness? (3) What is the level of the reading proficiency of IP learners in terms of reading fluency and reading comprehension? (4) Is there a significant relationship between the extent of the foundational reading literacy factors and the level of reading proficiency of IP learners? (5) What district-based capacity-building program in reading for teachers of IP learners may be proposed to enhance the reading proficiency of IP learners?

Significance of the Study - The researcher believes that the findings of the study will benefit the following: For IP Learners, the results of the study may lead to improved teaching strategies and interventions that directly enhance reading skills. The findings will guide teachers in adopting effective and culturally responsive methods of teaching reading. For school heads and administrators, the insights may inform supervisory practices and school-based programs to strengthen reading instruction. For district supervisors, the proposed capacity-building program can serve as a reference for district-wide professional development initiatives. For DepEd Occidental Mindoro, the study will serve as a reference for the Public Schools District Supervisor and the Department of Education (DepEd) Division of Occidental Mindoro in crafting localized reading programs and professional development plans. It will also provide evidence-based data for policy formulation and curriculum enhancement tailored to the needs of Indigenous Peoples (IP) schools in the division. For Parents of IP Learners, the study enables them to realize the importance of home and community support in promoting literacy. To the LGU Magsaysay, the results will guide the LGU in supporting educational programs for Indigenous learners through funding assistance, reading initiatives, and community-based literacy activities. It can also strengthen collaboration between schools and local government in promoting inclusive and equitable education. For future researchers, this study may serve as a basis for further investigation into reading proficiency and indigenous education.

Scope and Delimitation of the Study - This study focused on the foundational reading literacy factors affecting the reading proficiency of grades 1 to 6 IP learners of the 12 IP schools in Magsaysay, Occidental Mindoro, namely, Bagong Silang Elementary School, Bagong Silang Elementary School-Talayob Extension, Bamban Elementary School, Bambanay Elementary School, Calachuchi Elementary School, Canabang Elementary School, Emok Elementary School, Hinango Elementary School, Laste Elementary School-Kiko Extension, Nalwak Elementary School, Magarang Elementary School, and Magarang Elementary School-Pugo Extension. The respondents were grades 1 to 6 teachers, who provided data regarding the identified factors. Reading proficiency levels were determined through the results of the Comprehensive Reading and Literacy Assessment (CRLA) of the 645 grades 1 to 3 IP learners and the Philippine Informal Reading Inventory (Phil-IRI) results of the 653 grades 4 to 6 IP learners. The study was limited to the independent variables: language of instruction alignment, teachers' preparation and practice, home/community literacy environment, and learners' readiness. The dependent variable is the reading proficiency of IP learners, which includes the sub-variables of reading fluency and reading comprehension. The findings will be used solely to design a district-based capacity-building program and may not be generalized to non-IP schools. The study covered the school year 2025-2026.

2. Methodology

Research Design - This study employed an exploratory sequential design to identify the variables through qualitative analysis and subsequently to test the relationship between the independent and dependent variables. The exploratory sequential design involves collecting and analyzing qualitative data first, followed by the collection and analysis of quantitative data. This sequential approach is used when the researcher aims to explore a phenomenon or generate hypotheses before testing them with quantitative data (Creswell & Plano Clark, 2018). The gathered information and interpreted data guided the researcher on the next quantitative stage of the study. The quantitative aspect used the Comprehensive Reading and Literacy Assessment (CRLA), Philippine Informal Reading Inventory (Phil-IRI) results to determine learners' reading proficiency levels, and a survey questionnaire to identify the influence of independent factors. This research design was used to identify the foundational reading literacy factors that affect the reading proficiency of IP learners in Magsaysay, Occidental Mindoro.

Respondents of the Study - For the qualitative part of this study, the participants were fifteen (15) grades 1 to 6 teachers who were randomly selected from Rizal and Calintaan IP schools. Moreover, for the quantitative part of this study, the respondents consisted of seventy (70) grades 1 to 6 teachers of the 1,298 Indigenous Peoples (IP) learners across the twelve (12) IP schools in Magsaysay, Occidental Mindoro, of which 645 were from Grades 1 to 3 and 653 were from Grades 4 to 6. They were directly involved in teaching reading and were knowledgeable about learners' challenges. A complete enumeration method was used, where data were collected from every member of the population rather than a sample.

Research Instrument - To gather pertinent and relevant information needed for this study, the researcher had considered the nature of the research design. For the qualitative part of this study, an interview guide was administered to 15 teachers of IP schools in Calintaan and Rizal areas to solicit and extract codes from analyzed texts or transcribed interviews to form themes as a basis for locating instruments that use concepts parallel to the qualitative themes and to create scales and items as a questionnaire (Creswell, 2012). Moreover, a researcher-made survey questionnaire was used to gather quantitative data on the independent variables, namely: language of instruction alignment, teachers' preparation and practice, home/community literacy environment, and learners' readiness. These instruments aimed to identify the extent to which these factors influence the learners' reading proficiency. Together, these instruments provided comprehensive and reliable data for both quantitative and qualitative analyses.

Moreover, the interview guide was prepared by the researcher with the guidance of the research adviser. The survey questionnaire underwent expert validation by a panel of experts composed of an education supervisor, an IP education coordinator, and three DWCSJ graduate school professors. Their feedback was incorporated to refine the instruments for clarity, relevance, and appropriateness. Also, the teachers in Indigenous Peoples (IP) schools in San Jose, Rizal, and Calintaan areas served as the respondents of the pilot test of the instrument. The pilot study was conducted with 20 Grades 1-6 teachers who responded to the 24-item questionnaire, with each component having 6 items. The research instrument was evaluated using Cronbach's Alpha based on standardized items. The data were processed with 100% reliability, and no cases were excluded during the analysis. The generally accepted threshold for Cronbach's Alpha is 0.70, indicating acceptable internal consistency,

Table 1 provides the statistical analysis of the reliability results across the four different scales: Language of Instruction Alignment, Teachers' Preparation and Practice, Home/Community Literacy Environment, and Learners' Readiness.

Table 1
Result of Reliability Analysis

Items	Number of Items	Reliability Coefficients*	Analysis
A. Language of Instruction Alignment	6	.754	High Reliability
B. Teachers' Preparation and Practice	6	.730	High Reliability
C. Home/Community Literacy Environment	6	.739	High Reliability
D. Learners' Readiness	6	.814	High Reliability

*Based on standardized items

Learners' readiness yielded the highest reliability coefficient in the study (.814), indicating a high level of internal consistency among the six items. The internal consistency for the variable, language of instruction alignment is acceptable at .754. The Cronbach's Alpha of .739 meets the standard reliability level for the home and community literacy environment. The scale on teachers' preparation and practice garnered the lowest reliability score of .730. Overall, the four variables demonstrate high internal consistency, suggesting the instrument is generally highly reliable for data collection.

Data Gathering Procedure - The data collection process followed several systematic steps to ensure accuracy and validity. Firstly, the researcher sought the approval of the research adviser to prepare the approved questionnaires and other materials that would be needed for the conduct of the study. Letters of request crafted by the researcher to conduct the study were forwarded to the Schools Division Superintendent and Public Schools District Supervisors of San Jose, Calintaan, Rizal, and Magsaysay Districts. After obtaining all the important preliminaries and protocol before the conduct and administration of data gathering, the researcher proceeded to conduct the interview among the Grades 1-6 teachers in IP schools of Calintaan and Rizal districts. The researcher used one question and gathered responses for over 2 weeks through an online platform via messenger and Google Forms for the qualitative phase. The question was, " What are the factors affecting the reading proficiency of IP learners? The qualitative data were generated from the written answers of the teacher-respondents and underwent thematic analysis for 2 days. Recording, tabulation, and coding were done to extract the themes. The initial,

developing, and final thematic maps were illustrated to identify the final themes. Following this, survey questionnaire forms were distributed to the 70 teacher-respondents for over 2 weeks to gather quantitative data on the identified factors affecting reading proficiency. Finally, all collected data were carefully collated, analyzed, and interpreted to draw meaningful conclusions and recommendations.

Statistical Treatment of the Data - The qualitative data generated through the interviews of the teacher-respondents underwent thematic analysis. Recording, transcription, tabulation and coding were done to extract the themes. The initial, developing, and final thematic maps were illustrated to identify the final themes. The statistical techniques that were employed in this study to arrive at reliable results were generated by SPSS version 26 and WarpPLS version 7.0 to describe the level of reading proficiency of the IP learners in Magsaysay, Occidental Mindoro. The Structural Equation Modeling by WarpPLS version 7.0 was employed to determine the relationship between the independent variables- language of instruction alignment, teachers’ preparation and practice, home/community literacy environment, and learners’ readiness, and the dependent variable, reading proficiency in terms of reading fluency and comprehension.

Ethical Considerations - This study strictly observed ethical research standards throughout its conduct. The researcher listed the sources used as references in this study. The American Psychological Association (APA) citation was used to acknowledge the ideas of researchers and authors. This study only aimed to contribute to the innovations in education and did not really cause harm to anyone involved in this study. All participants were provided with informed consent, ensuring that they were fully briefed about the purpose, procedures, and confidentiality of the study before their participation. Voluntary participation was emphasized, and respondents were informed that they may withdraw at any time without any penalty or negative consequence. Confidentiality was maintained by keeping the identities of participants and schools anonymous, and all gathered data were used solely for research purposes.

3. Results and Discussions

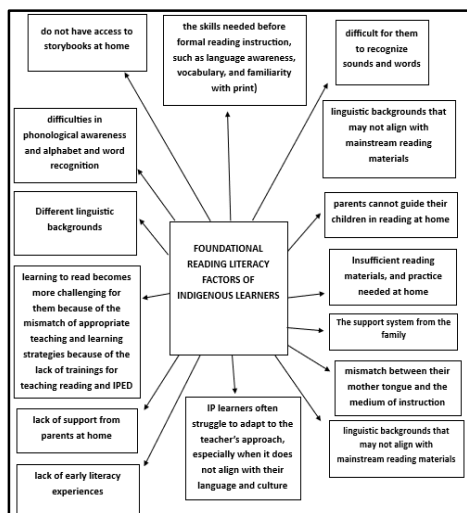


Figure 1. Initial Thematic Map of Foundational Reading Literacy Factors of Indigenous Learners

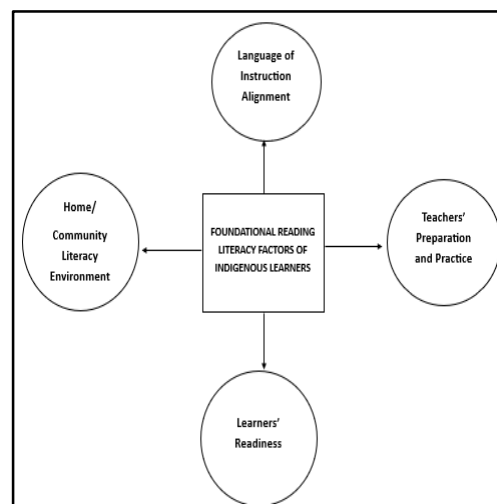


Figure 2. Final Thematic Map of Foundational Reading Literacy Factors of Indigenous Learners

Figure 1 presents the foundational reading literacy factors of IP learners. Moreover, it shows factors affecting the reading proficiency of IP learners. Indigenous learners’ reading proficiency is shaped by a complex interplay of home, school, and linguistic factors. IP learners often lack exposure to print-rich environments at home. Maceda (2025) found that insufficient resources significantly hinder reading proficiency in rural schools. Limited access to storybooks and print-rich environments at home restricts early literacy exposure, which is critical for developing foundational skills (Dong et al., 2020). Phonological awareness and word recognition difficulties further hinder progress, as these skills are strong predictors of reading success (Al Otaiba et al., 2019). Altogether, these factors

emphasize the need for equity-driven interventions that combine home literacy support, phonological awareness instruction, and culturally responsive teaching to improve reading proficiency among indigenous learners.

The final thematic map, as shown in Figure 2, for the foundational reading literacy factors of IP learners is an updated version that reflects the analysis and refinement of the initial thematic diagram. It consolidates the foundational reading literacy factors affecting indigenous learners' reading proficiency into four domains: language of instruction alignment, teachers' preparation and practice, learners' readiness, and home/community literacy environment. This structure reflects the systemic nature of literacy challenges and is well-supported by literature. Mismatches between learners' mother tongue and the language of instruction often hinder comprehension, highlighting the importance of Mother Tongue-Based Multilingual Education (MTB-MLE) mandated under RA 10533 (Tortola, 2021). Learner readiness, particularly phonological awareness, vocabulary, and familiarity with print, is a strong predictor of reading success (Al Otaiba et al., 2019). Meanwhile, the home and community literacy environment plays a decisive role; limited access to storybooks and lack of parental guidance reduce early literacy exposure, while parental involvement and expectations significantly enhance reading comprehension (Dong et al., 2020; Bahian & Dechos, 2025; Cuartero-Enteria & Tagyam, 2020). Altogether, these interconnected domains emphasize that improving indigenous learners' reading proficiency requires a holistic approach that integrates culturally aligned instruction, enriched home literacy environments, teacher training, and early literacy skill development.

Table 2 mirrors the mean extent of the foundational reading literacy factors of IP learners. It could be noted from the given table that two (2) indicators yielded a composite mean of 4.2, which could be interpreted as "Very High." This suggests that language of instruction alignment and teachers' preparation and practice are extensively evident and consistently practiced. Meanwhile, two (2) indicators yielded a composite mean that could be interpreted as "High," which ranges from 4.21 to 4.27 and 3.90 to 4.11, respectively. The importance of coherence in lesson planning is emphasized by Genon and Torres (2020). Gempeso and Mendez (2025) highlighted the need to elevate assessment practices to foster HOTS, and Abejueala et al. (2023) demonstrated how weak alignment in reading instruction undermined learner outcomes. Collectively, they affirmed that without systematic alignment, instructional practices risked falling short of policy goals, thereby limiting learners' opportunities to achieve foundational and advanced literacy competencies. Meanwhile, the lowest composite mean was attributed to the third variable, Home/Community Literacy Environment, with a 3.90 mean score. This suggests that although it is evident and practiced to a great extent, it is the least developed among the variables, indicating a need for further strengthening to better support learners' reading development. According to Johnson et al (2025) and Paakkari et al. (2024), the literacy environment in learners' homes and communities also affects reading proficiency. Children who are exposed to books, storytelling, and other print-rich experiences at home tend to develop stronger reading skills, particularly when parents and family members actively engage in reading-related activities and provide access to literacy materials.

Consistent home-based support plays a key role in developing advanced early reading skills among Grade 1 learners, particularly when facilitators provide motivation, structured routines, and learning materials, as reinforced by Eclarinal (2025). Similarly, Mariano (2026) found strong correlations between facilitators' support and kindergarten learners' literacy skills, leading to the development of enhanced beginning reading materials. These findings aligned with Dong et al. (2020), who emphasized that parental involvement and literacy expectations exert stronger influence on comprehension than the mere availability of resources, underscoring the decisive role of active engagement. Furthermore, Katranci et al. (2018) and Kim and Yim (2024) further explored the nuances of home literacy environments. Katranci found that while parents held strong reading beliefs, socioeconomic factors did not directly shape literacy outcomes, suggesting that attitudes alone are insufficient without structured practices. Kim and Yim, however, showed that bilingual families benefit from heritage-language literacy environments, with direct practices in Korean and indirect strategies in English fostering proficiency in both languages and enhancing conceptual vocabulary. These findings collectively affirmed that literacy environments must be both culturally relevant and strategically structured to maximize impact.

Table 2
Mean Extent of the Foundational Reading Literacy Factors of Indigenous Learners

Language of Instruction Alignment	Weighted Mean	Interpretation
1. The language I use in teaching reading is aligned with my learners' mother tongue.	4.39	Very High
2. Learners understand reading lessons better when my instruction is delivered in their first language.	4.50	Very High
3. The shift from mother tongue to Filipino/English affects my learners' reading proficiency.	4.10	High
4. Instructional materials that I provide are consistent with the learners' language background.	4.34	Very High
5. The lack of reading resources in the mother tongue hinders my learners' reading development.	3.91	High
6. The use of learners' first language helps improve my learners' reading comprehension.	4.39	Very High
Composite Mean	4.27	Very High
Teachers' Preparation and Practice		
1. I have received sufficient training in teaching reading to Indigenous learners.	3.46	High
2. I am confident in applying MTB-MLE strategies in teaching early-grade reading.	4.20	Very High
3. I align my teaching strategies with learners' cultural and linguistic backgrounds.	4.41	Very High
4. I am provided with adequate professional development related to reading instruction.	4.27	Very High
5. My teaching preparation addresses the diverse needs of Indigenous learners.	4.50	Very High
6. I am familiar with effective strategies for teaching reading.	4.40	Very High
Composite Mean	4.21	Very High
Home/Community Literacy Environment		
1. Parents actively support their children's reading development at home.	3.56	High
2. My learners have access to reading materials (books, storybooks, etc.) at home.	3.83	High
3. Storytelling and traditional literacy practices are encouraged in the community.	3.89	High
4. Community initiatives support my learners' literacy development (e.g., reading camps, libraries).	3.79	High
5. Limited home/community literacy exposure affects my learners' ability to read.	4.11	High
6. Limited literacy support at home affects learners' reading performance.	4.20	Very High
Composite Mean	3.90	High
Learners' Readiness		
1. Most of my learners enter Grade 1 with sufficient oral language skills.	3.69	High
2. My learners show motivation and interest in learning to read.	3.99	High
3. Early childhood experiences (e.g., day care, preschool) contribute to my learners' readiness for reading.	4.36	Very High
4. Socio-emotional readiness (confidence, attention span) influences my learners' reading progress.	4.27	Very High
5. My learners' reading proficiency is affected by their preparedness to cope with formal schooling	4.19	High
6. My learners' prior experience affect their ability to understand texts.	4.16	High
Composite Mean	4.11	High
Overall Mean	4.12	High

Scale: 4.20-5.00 Very High; 3.40 -4.19 High; 2.60-3.39 Moderate; 1.80-2.59 Low; 1.00-1.79 Very Low

Meanwhile, Grolig (2020) provided a broader framework through the triad model of shared storybook reading, demonstrating that outcomes depend on the interplay of literacy agents—children, adults, and books. Repeated readings, wordless picture books, and comprehension questioning were shown to enhance engagement and oral language development, reinforcing the importance of interactive literacy practices. Nevertheless, Librea et al. (2023) and Roque et al. (2023) highlighted systemic and parental factors influencing literacy outcomes. Librea identified seven sub-themes contributing to low literacy skills, including lack of materials, diminished enthusiasm, and limited parental involvement, recommending continuous monitoring and diagnostic assessments. Roque found that parents' educational attainment influenced children's reading abilities, while employment status did not, suggesting that parental education is more critical than socioeconomic status.

Meanwhile, Teachers' preparation and practice, and Learner readiness yielded a mean score of 4.21 "Very High" and 4.11 "High" respectively. In relation to Teachers' preparation and practice, Infante (2026) and Alcantara (2026) underscored the link between teacher competence and performance. Infante found that educational attainment significantly influenced competencies in phonemic awareness and assessment practices, with strong correlations to work performance. Alcantara confirmed that remedial reading programs were generally implemented but faced moderate challenges, pointing to the need for improved instructional support and professional development. Casinto (2025) added that multi-faceted approaches—combining pedagogy, resource management, and school-family collaboration—are essential to address reading skill gaps holistically.

Moreover, Guerrero (2025) and Pacleb (2026) highlighted the centrality of teacher-driven interventions. Guerrero found that teacher-perceived factors strongly correlated with Phil-IRI results, while learner-perceived factors did not, underscoring the decisive role of teachers in shaping outcomes. Pacleb confirmed that despite challenges in resources and parental involvement, teachers consistently engaged in planning, monitoring, and remediation, leading to the introduction of an enhanced foundational reading program. Giles (2026) further validated this by establishing a strong positive relationship between remedial approaches and learners' progress, emphasizing the importance of effective remediation. Relative to students' readiness, Guerrero (2025) emphasized that reading proficiency is shaped by motivation, instructional materials, strategies, and support, with teachers playing a decisive role in influencing learner outcomes. Although both learners and teachers perceived these factors as highly impactful, Phil-IRI results showed that learners remained at the instructional level despite improved scores. Teacher-perceived factors correlated strongly with outcomes, underscoring the importance of teacher-driven interventions.

Preparing children for reading requires addressing readiness deficiencies, a necessity reinforced by Akubילו (2015). Barriers such as socio-economic background, physical and mental conditions, lack of interest, unfamiliarity with symbols, and teacher limitations were identified. The study recommended that parents provide books and stimulating environments to cultivate reading habits, linking home support with school readiness. Consequently, Xuan et al. (2018) highlighted that while learners demonstrated high motivation, they lacked awareness and application of autonomous learning strategies, particularly metacognitive approaches essential for self-directed learning. Learner-centered activities such as peer review, reflective journals, and synthesis tasks were suggested to strengthen readiness, complementing Guerrero's findings on the need for structured teacher interventions. Meanwhile, Alwadaeen and Piller (2022) extended this perspective by stressing the role of society—guardians, families, and the private sector—in boosting self-directed learning readiness. They argued that raising awareness of community partnership enhances emotional and social dimensions, which positively influence cognitive and literacy development. This aligns with Akubילו's emphasis on parental involvement and Xuan's call for learner-centered strategies, showing readiness as a shared responsibility across home, school, and community.

Table 3

Level of Reading Fluency of Grades 1-6 Indigenous Learners in Filipino and English

CRLA -Filipino (Grades 1-3)			
Percentage Descriptor	Reading Fluency Level	Frequency	Percent
0	Low Emerging	107	16.6
1 – 25	High Emerging	137	21.2
26 – 50	Developing Reader	145	22.5
51 – 75	Transitioning Reader	93	14.4
76 – 100	Reading at Grade Level	163	25.3
CRLA – English (Grade 3)			
Percentage Descriptor	Reading Fluency Level	Frequency	Percent
0	Low Emerging	17	8.0
1 – 25	High Emerging	43	20.3
26 – 50	Developing Reader	48	22.6
51 – 75	Transitioning Reader	37	17.5
76 – 100	Reading at Grade Level	67	31.6
Total (Grades 1-3)		645	100.00

Phil-IRI – Filipino (Grades 4-6)			
Percentage Descriptor	Reading Fluency Level	Frequency	Percent
89 and below	Frustration	223	34.2
90 – 96	Instructional	264	40.4
97 – 100	Independent	166	25.4
Phil-IRI – English (Grades 4-6)			
Percentage Descriptor	Reading Fluency Level	Frequency	Percent
89 and below	Frustration	369	56.5
90 – 96	Instructional	196	30.0
97 – 100	Independent	88	13.5
Total (Grades 4-6)		653	100.0
Total (Grades 1-6)		1,298	

The results of the Comprehensive Rapid Literacy Assessment (CRLA) reveal varying levels of reading fluency among Grades 1–3 IP learners in both Filipino and English. In Filipino, the majority of grades 1-3 learners are classified as Developing Readers (22.5%) and Reading at Grade Level (25.3%), indicating that while a significant portion of learners are progressing toward proficiency, a considerable number remain in the Emerging stages (37.8% combined for low and high emerging). This pattern suggests that early literacy interventions are moderately effective but still require reinforcement, particularly for those struggling with foundational reading skills. In English, the distribution shows improvement, with 31.6% of Grade 3 learners reading at grade level and only 8% categorized as Low Emerging. The higher fluency in English may reflect increased exposure to bilingual instruction or the influence of school-based reading programs. Overall, the CRLA results demonstrate gradual literacy development among indigenous learners, emphasizing the need for sustained support in phonological awareness and vocabulary enrichment to achieve full fluency across both languages.

The Philippine Informal Reading Inventory (Phil-IRI) results for Grades 4–6 indigenous learners show distinct patterns of reading proficiency in Filipino and English. In Filipino, most learners fall within the Instructional Level (40.4%), followed by the Frustration Level (34.2%) and the Independent Level (25.4%). This indicates that while many learners can read with teacher assistance, a substantial proportion still struggle with comprehension and fluency, reflecting the lingering effects of early reading difficulties. In English, the trend shifts toward lower proficiency, with more than half (56.5%) of learners at the Frustration Level and only 13.5% reaching the Independent Level. This disparity highlights the challenges indigenous learners face in mastering English reading skills, likely due to linguistic mismatches and limited exposure to English texts at home. The Phil-IRI findings underscore the importance of differentiated instruction and culturally responsive materials to bridge the gap between Filipino and English literacy, ensuring that learners develop balanced reading proficiency across both languages.

Higher reading proficiency levels (RPL) are directly linked to stronger academic performance (AP), with female students consistently outperforming male students, as established by Gabejan and Quirino (2021). These findings led to recommendations for targeted interventions to strengthen reading skills and foster independence, particularly among groups demonstrating lower proficiency. Relative to this, Romualdo (2026) reinforced this by showing that primary grade teachers moderately implemented reading intervention strategies across instructional approaches, materials, monitoring, and parental involvement. Learners were described as moderately skilled in phonological awareness, word recognition, fluency, and comprehension. Importantly, a strong positive correlation was found between intervention strategies and learners’ skills, prompting the development of an enhanced emergent literacy program. Meanwhile, Casingal and Balaba (2026) demonstrated that while elementary learners continued to face persistent challenges, junior high school results showed substantial gains, including a reduction in frustration-level readers and a modest increase in independent readers. These findings suggest that systematic interventions, when adequately supported, can yield meaningful improvements in literacy education, complementing Romualdo’s emphasis on structured programs.

Contextual factors such as gender, parental support, access to computers, and home atmosphere significantly influence pupils’ SRI Lexile scores, thereby supporting Elger’s Theory of Performance, as highlighted by Maleon

(2022). This underscores the importance of considering both home and school environments in structuring effective literacy interventions, linking with Gabejan and Quirino’s findings on gender differences. In connection with this, Casingal et al. (2026) demonstrated that systematic use of Phil-IRI, alongside Dolch tests, significantly improved fluency and comprehension among Grade 4 pupils. Their school-based program successfully transformed struggling readers into accelerated learners, highlighting the importance of methodical assessment administration, teacher training, and remedial classes tailored to learners’ needs.

Moreover, Taguinod (2025) reinforced the role of school context and resource availability, showing that learners generally achieved satisfactory accuracy and comprehension, though mispronunciation remained the most common miscue. Central school learners outperformed those in non-central schools, with significant relationships found between accuracy, comprehension, and miscues. These findings underscore the importance of equitable access to resources and academic support in shaping Phil-IRI outcomes. Besides, Saguig (2024) added nuance by examining diverse learner demographics and home support. While learners demonstrated proficiency in decoding, word recognition, fluency, and comprehension, Phil-IRI assessments revealed differences in competency strengths. A positive, though not statistically significant, relationship was observed between oral reading skills and Phil-IRI outcomes. The study recommended targeted interventions, increased parental involvement, and equitable access to reading materials to strengthen readiness and performance. Furthermore, Tolibas (2025) highlighted persistent challenges among intermediate-grade learners, particularly those in Grades 4 to 6. Most remained at the instructional level, requiring teacher assistance to comprehend texts, while a notable proportion—especially male students—were at the frustration level. The study recommended structured intervention programs focusing on learners at instructional and frustration levels, differentiated instruction, professional development for teachers, and parental involvement through literacy workshops and home-based activities.

Table 4 presents the level of Reading Comprehension of Grades 1-3 IP learners in Filipino and English and Grades 4-6 Indigenous Learners in Filipino and English as measured by CRLA and Phil-IRI, respectively. The results of the Comprehensive Rapid Literacy Assessment (CRLA) show that a large proportion of Grades 1–3 IP learners remain at the High Emerging stage in Filipino (45.4%), with only 10.5% reading at grade level. This indicates that while many learners are beginning to acquire basic comprehension skills, most are still struggling to transition toward independent reading. The distribution across Developing (16.7%) and Transitioning (27.3%) levels suggests gradual progress, but the relatively low percentage of grade-level readers highlights the need for stronger early literacy interventions. In English, the pattern is slightly more balanced, with 19.8% reading at grade level and 29.7% at the Transitioning stage. However, 31.6% remain at the High Emerging level, showing that comprehension in English is still a challenge for many grade 3 learners. These findings emphasize that while bilingual instruction provides exposure to English, IP learners require more targeted support in comprehension strategies, vocabulary development, and culturally relevant materials to strengthen both Filipino and English literacy.

Table 4

Level of Reading Comprehension of Grades 1-6 Indigenous Learners in Filipino and English

CRLA – Filipino (Grades 1-3)			
Percentage Descriptor	Reading Comprehension Level	Frequency	Percent
0	High Emerging	293	45.4
1 – 39	Developing Reader	108	16.7
40 – 79	Transitioning Reader	176	27.3
80 – 100	Reading at Grade Level	68	10.5
CRLA -English (Grade 3)			
Percentage Descriptor	Reading Comprehension Level	Frequency	Percent
0	High Emerging	67	31.6
1 – 39	Developing Reader	40	18.9
40 – 79	Transitioning Reader	63	29.7
80 – 100	Reading at Grade Level	42	19.8
Total (Grades 1-3)		645	

Phil-IRI -Filipino (Grades 4-6)			
Percentage Descriptor	Reading Comprehension Level	Frequency	Percent
58 and below	Frustration	108	16.5
59 – 79	Instructional	202	30.9
80 – 100	Independent	343	52.5
Phil-IRI -English (Grades 4-6)			
Percentage Descriptor	Reading Comprehension Level	Frequency	Percent
58 and below	Frustration	209	32.0
59 – 79	Instructional	240	36.8
80 – 100	Independent	204	31.2
Total (Grades 4-6)		653	
Total (Grades 1-6)		1,298	

Improving reading performance requires consistent, targeted fluency-building interventions along with sustained teacher development, as emphasized by Hipolito (2026). However, instructional planning, strategy application, progress monitoring, and parental involvement were only occasionally practiced by primary grade teachers. Learners demonstrated emerging fluency in accuracy, speed, prosody, and comprehension, with significant differences noted between results from the reading fluency assessment and the CRLA tool. Weak, non-significant correlations between instructional practices and fluency outcomes prompted the development of an enhanced reading support program to strengthen instructional practices and improve fluency. Casingal et al. (2025) demonstrated that structured school-based interventions can substantially improve both fluency and comprehension among Grade 4 learners. Their findings aligned with Pado et al. (2018), who argued that independent reading proficiency represents the highest literacy achievement level. By transforming struggling readers into accelerated learners, the study underscored the importance of systematic assessment protocols such as Phil-IRI and Dolch tests, alongside remedial programs tailored to individual needs. Meanwhile, Taguinod (2025) emphasized the influence of academic support, school context, and resource availability on comprehension outcomes. Learners generally demonstrated satisfactory accuracy and comprehension, though mispronunciation was the most common miscue. Central school learners outperformed those in non-central schools, with significant relationships found between accuracy, comprehension, and miscues. These findings highlighted the role of equitable access to resources and supportive school environments in shaping reading comprehension.

The Philippine Informal Reading Inventory (Phil-IRI) results for Grades 4–6 revealed a more advanced distribution of comprehension levels compared to the younger cohort. In Filipino, more than half of the learners (52.5%) reached the Independent level, demonstrating strong comprehension skills and the ability to read without assistance. Meanwhile, 30.9% are at the Instructional level, and only 16.5% remain at the Frustration level, indicating that Filipino reading comprehension improves significantly as learners progress through the grades. In contrast, English comprehension presents greater challenges: 32% of learners are at the Frustration level, 36.8% at the Instructional level, and only 31.2% at the Independent level. This distribution shows that while some learners achieve proficiency in English, a substantial proportion still struggle, reflecting the linguistic mismatch between their mother tongue and the medium of instruction. Relative to this, Casingal et al. (2025) provided strong evidence of the effectiveness of systematic interventions, reporting substantial improvements in fluency and comprehension among Grade 4 learners. Their findings aligned with Pado et al.'s (2018) assertion that independent reading proficiency represents the optimal literacy achievement level. The school-based intervention exceeded expectations by transforming struggling readers into accelerated learners, underscoring the importance of rigorous assessment protocols such as Phil-IRI and Dolch tests to ensure accurate diagnostics and targeted interventions.

Similarly, Casingal et al. (2026) confirmed significant gains in fluency and comprehension among Grade 4 pupils, with the school-based program achieving its primary objective of converting struggling readers into accelerated learners. The study recommended methodical administration of Phil-IRI and Dolch tests, teacher training in assessment, and the design of remedial classes tailored to learners' specific needs, reinforcing the earlier findings of Casingal et al. (2025). Moreover, Lumecio et al. (2026) demonstrated that shared reading interventions

significantly improved word recognition and comprehension, moving most learners from frustration to instructional and independent levels. This highlighted the effectiveness of structured, interactive approaches in equipping primary learners with essential skills for academic success.

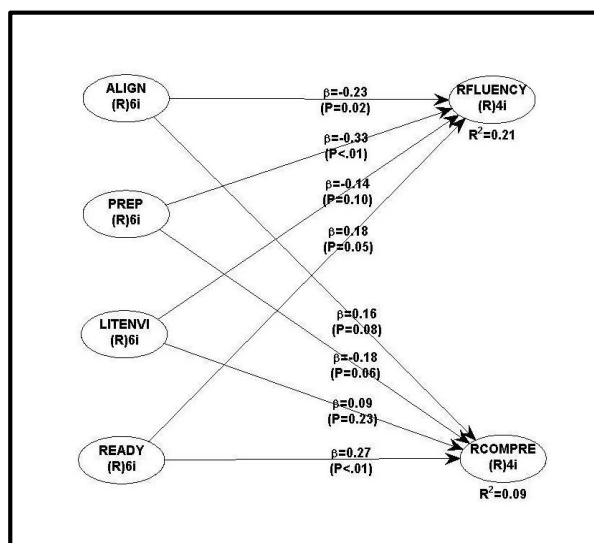


Figure 3. Structural Model of the Relationship Between Reading Factors and Reading Proficiency Level

This structural equation model (SEM) in Figure 6 presents the test of the influence of the reading factors in terms of language of instruction alignment (ALIGN), teachers’ preparation and practice (PREP), home/community literacy environment (LITENVI), and learners’ readiness (READY) on two endogenous outcomes of reading proficiency in terms of reading fluency and reading comprehension. The results are generated by WarpPLS version 7.0. Beta coefficients reveal negligible to low values from 0.09 to -0.33. P-values show the significance of the relationship of the variables in the study, which is anchored on the .05 threshold. The paths registered p-values from <.01 to .23. The R2 values indicate how much of the variance in the dependent variables is explained by the four reading factors. The model accounted for 21% of the variance in reading fluency ($R^2=0.21$), which suggests a modest but significant explanatory power. The model explains only 9% of the variance in reading comprehension ($R^2=0.09$), indicating that many other factors outside this model likely influence comprehension. While learners’ readiness is important, 91% of the variance in comprehension remains unexplained by this specific set of variables. Future studies may consider incorporating mediating variables, such as vocabulary depth or metacognitive strategies, to provide a more comprehensive view of the factors affecting reading proficiency.

Table 5
Beta Coefficients of the Paths and p-values for Ho

Paths	Beta (β) Coefficient	p-value*	Interpretation
Ho: Reading Factors → Reading Proficiency Level			
ALIGN→RFLUENCY	-0.230	.021	Significant
ALIGN→RCOMPRE	0.161	.080	Not Significant
PREP→RFLUENCY	-0.327	.002	Significant
PREP→RCOMPRE	-0.177	.061	Not Significant
LITENVI→RFLUENCY	-0.145	.104	Not Significant
LITENVI→RCOMPRE	0.088	.226	Not Significant
READY→RFLUENCY	0.184	.053	Not Significant
READY→RCOMPRE	0.270	.008	Significant

*Significant at $p < 0.05$

Table 5 presents the eight path coefficients and p-values for the null hypothesis which posits no significant relationship between the identified factors in reading and the reading proficiency of indigenous learners. The null hypothesis was rejected for three specific paths, meaning a statistically significant relationship was found. Teachers’ preparation and language of instruction alignment both significantly influence reading fluency. However, the negative beta coefficients indicate that higher levels of these variables are associated with lower fluency scores in

this dataset. The learners' readiness showed a positive and significant relationship with reading comprehension, suggesting it is a primary driver for understanding text. The result is supported by what Saguing (2024) found, that learner readiness significantly correlates with reading proficiency as measured through standardized tools like the Philippine Informal Reading Inventory (Phil-IRI), indicating that learners with higher readiness levels tend to perform better in reading assessments. Learner readiness plays a crucial role in the development of reading proficiency, particularly in the elementary years. Learners who demonstrate readiness in areas such as phonemic awareness, vocabulary, attention span, and motivation are more likely to succeed in reading tasks and overall literacy development.

Moreover, learner readiness is influenced by early childhood experiences, including exposure to language, preschool education, and supportive learning environments. The Department of Education (DepEd, 2025) highlights that early childhood care and development programs contribute to learners' physical, cognitive, and emotional readiness, which are essential for literacy acquisition. Children who are well-prepared before entering formal schooling are more capable of engaging in reading activities and developing comprehension skills effectively. Persistent gaps in assessment practices and curriculum articulation have been identified, with teachers often left to independently interpret and operationalize objectives, as highlighted by Genon and Torres (2020). Such misalignments negatively affected student achievement, as instructional coherence is essential to maximizing learning opportunities. Their findings emphasized that academic performance improves when lesson plans are systematically aligned with benchmarks, standards, and assessments, ensuring that instructional delivery supports curriculum expectations.

Building on this, Gempeso and Mendez (2025) revealed significant inconsistencies between classroom assessments and policy guidelines, particularly in linking intended learning outcomes with teaching activities, assessment criteria, and the medium of instruction. They observed that many classroom tasks were limited to lower-order cognitive levels, thereby undermining the policy's goal of fostering higher-order thinking skills (HOTS). Moreover, the absence of activities to evaluate macro skills constrained the effectiveness of the Mother Tongue-Based Multilingual Education (MTB-MLE) program. Their study concluded that both instructional delivery and assessment practices must be systematically aligned with policy standards to provide learners with meaningful opportunities to develop advanced literacy skills. These concerns were further reinforced by Abejuela et al. (2023), who examined reading competencies within the basic education curriculum. They categorized skills into text processing and task management, finding that most learners were instructional rather than independent readers, with some identified as non-readers even at the secondary level. Importantly, the study noted weak alignment among the written, assessed, and delivered curriculum in reading. Prior to the COVID-19 pandemic, reading instruction was more extensive and teacher-directed, but during the new normal, reliance on self-paced modules and limited digital resources reduced instructional variety. This misalignment meant that several learning outcomes specified in the K-12 curriculum guide were not adequately processed or assessed, underscoring the need for stronger coherence between curriculum design, instructional delivery, and assessment practices.

In other cases, the model failed to reject the null hypothesis, as shown in the home/community literacy environment and learner readiness. These factors did not significantly influence either reading fluency or comprehension, suggesting that for this specific group, the immediate literacy environment as measured may not be the primary determinant of reading performance of the indigenous learners. The null hypothesis failed to be rejected for all paths involving the literacy environment and the path of learner readiness to reading fluency. In these instances, the data did not provide sufficient evidence to conclude that a significant relationship exists. Persistent gaps in assessment practices and curriculum articulation have been noted, with teachers frequently left to independently interpret and operationalize learning objectives, as highlighted by Genon and Torres (2020). Such misalignments negatively affected student achievement, as instructional coherence is essential to maximizing learning opportunities. Their findings emphasized that academic performance improves when lesson plans are systematically aligned with benchmarks, standards, and assessments, ensuring that instructional delivery supports curriculum expectations.

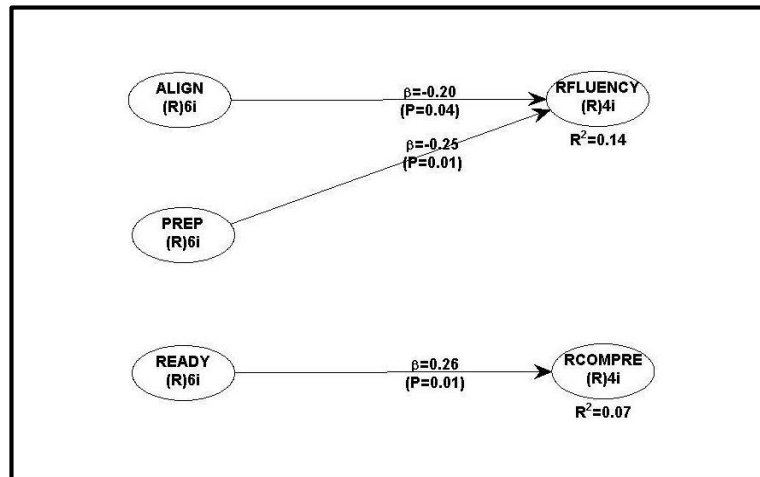


Figure 4. The Emerging Model of the paths alignment to Reading Fluency, Teachers' Preparation for fluency, and comprehension

The emerging model in Figure 4 represents a refined version of the structural analysis, retaining only the paths that reached statistical significance. The new model explains 14% of the variance in reading fluency ($R^2=0.14$) using only language of instruction alignment and teachers' preparation and practice. Only 7% of the variance in comprehension ($R^2=0.07$) is explained by readiness alone. This confirms that while readiness is necessary, comprehension is a complex cognitive process influenced by many other external or internal factors not captured in this specific model. All three paths alignment to reading fluency, teachers' preparation to fluency, and to comprehension are interpreted as having a small effect size, with coefficients ranging from .058 to .082. This suggests a small practical impact on reading fluency and comprehension. While these relationships are statistically significant, their actual impact on the variance of reading proficiency is modest. The negative effect of teacher preparation on reading fluency, despite being significant, yields a small effect. This may imply that while teacher preparation as currently implemented has a measurable impact, its practical ability to shift fluency scores is limited. This suggests that, aside from increasing the amount of preparation, the nature of the teacher's preparation may need to change. Research suggests that teachers' training, pedagogical knowledge, and familiarity with culturally responsive approaches directly impact learners' literacy outcomes (Darling-Hammond, 2017). Thus, aligning teacher preparation with the unique needs of IP learners is essential.

Table 6

Capacity-Building Program for Teachers of IP Learners for Reading Proficiency Enhancement

I. PROGRAM OVERVIEW The program is aligned with DepEd Order No. 32, s. 2015

(Indigenous Peoples Education Curriculum Framework)

Program Title	SAMA-SAMA SA PAGBASA (Together in Reading)
Program Goal	To enhance the reading readiness of IP learners and teachers' competence in delivering culturally responsive, linguistically appropriate reading instruction across elementary schools in Magsaysay District within one academic year
Target Beneficiaries	1,298 IP learners across 12 elementary schools; 70 elementary teachers; 12 school heads
Program Duration	One Academic Year (10 months: June 2026 – March 2027)

DISTRICT-LEVEL PROGRAMS, PROJECTS, AND ACTIVITIES (SY 2026-2027)

II. Program: District Capacity-Building Program for Teachers of IP Learners for Reading Proficiency Enhancement

Activity/PPA	Description	Focal Person/s	Resources Needed	Budget	Timeline
1 District Reading Summit for IP Education	One-day gathering of all school principals, reading coordinators, master teachers, and IP community representatives to launch the	PSDS, District Reading Coordinator, School Principals, Mangyan Leaders	Venue, meals, materials, honoraria, and transportation for IP representatives	₱50,000	July

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	program, share best practices, analyze district-wide reading data, and plan coordinated interventions				
2. District-Wide Reading Assessment Coordination	Standardized administration and analysis of CRLA and Phil-IRI across all 12 schools; consolidation of district-level data disaggregated by IP learners to identify trends and priority areas	PSDS, District Reading Coordinator, School Principals	Assessment materials, data analysis tools, and data entry personnel	₱30,000	August (Pre-test), March (Post-test)
3. Teacher Capability-Building in Teaching IP Learners Training Series	Quarterly district-level professional development on: (1) Teaching reading in the IP mother tongue and MTB-MLE (August); (2) Developing reading fluency and comprehension strategies (October); (3) Language transition strategies and English as a third language instruction (January); (4) Culturally responsive pedagogy and assessment (March)	PSDS, District Reading Coordinator, External Resource Speakers, Mangyan Cultural Experts	Training materials, venue, meals, honoraria, and accommodation	₱50,000	Quarterly (Aug, Oct, Jan, Mar)
4. Learning Journey: Visit to Model Schools	Facilitated visits of teachers and school leaders to model schools within the district that demonstrate exemplary reading practices with IP learners	PSDS, School Principals	Transportation, meals, documentation	₱30,000	November
5. District Reading Materials Development Hub for IP Learners	Establishment of a district-level facility for developing, reproducing, and distributing culturally relevant reading materials in the IP language, Filipino, and English	PSDS, District Reading Coordinator, Mangyan Cultural Advisers	Printing equipment, paper, binding materials, software, and computers	₱80,000	September-October
6. IP Learners Reading Festival	Semi-annual district-wide reading competitions, storytelling festivals in the mother tongue, and literacy exhibits showcasing Mangyan learner and teacher work	PSDS, District Reading Coordinator, School Principals	Venue, prizes, materials, meals, sound system	₱60,000	December, March
7. Monitoring and Provision of Technical Assistance	Regular district-level monitoring visits to all 12 schools to provide technical assistance on reading instruction, assessment, and intervention implementation for IP learners (monthly visits)	PSDS, District Reading Coordinator, Education Program Supervisors	Transportation, monitoring tools, and vehicle fuel	₱50,000	Monthly (Aug-Mar)
TOTAL				₱350,000	

III. ONE-YEAR IMPLEMENTATION TIMELINE MATRIX (SY 2026-2027)

Activity/PPA	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1 District Reading Summit	✓								
2 Assessment Coordination		✓							✓
3 Teacher Training Series		✓		✓			✓		✓
4 Cross-Visit Program					✓				
5 Materials Development Hub			✓	✓					
6 Reading Festival					✓				
7 Monitoring & TA		✓	✓	✓	✓	✓	✓	✓	
8 Teacher Recognition			✓		✓		✓		✓

9 Reading Caravan				✓	✓	✓	✓	✓	
10 Data Management			✓	✓				✓	✓

Based on **DepEd Order No. 43, s. 2013** (Project Development and Management Framework) and DepEd Project Management Guidelines

IV. MONITORING AND EVALUATION FRAMEWORK

Level	M&E Activity	Frequency	Responsible	Key Data Sources
District	Monthly School Visits	Monthly	PSDS, District Coordinator	Monitoring forms, technical assistance reports
District	Quarterly Data Consolidation	Quarterly	District Coordinator	District-wide reading data, school comparisons
District	Reading Festival Evaluation	Semi-annually	District Coordinator	Participation rates, evaluation forms
District	End-of-Year Program Evaluation	March	PSDS, Principals	Accomplishment reports, financial reports

Roles and responsibilities matrix

Focal Person	Role	Key Responsibilities
Public Schools District Supervisor (PSDS)	District Program Manager	Oversees district-level implementation; coordinates with school heads; reports to division; ensures resource allocation; leads district summit and training
District Reading Coordinator	District Program Lead	Facilitates district-level activities; provides technical assistance; consolidates data; leads training sessions; manages materials hub
School Principal	School Program Manager	Leads school-level implementation; monitors progress; allocates school resources; engages the community; conducts LAC sessions
School Reading Coordinator	School Program Lead	Coordinates reading activities; analyzes reading data; leads LAC sessions; reports to principal; consolidates CRLA and Phil-IRI results
Master Teacher	Instructional Coach	Mentor teachers; conducts demonstration teaching; leads lesson study; develops materials
Classroom Teacher	Implementer	Delivers daily reading instruction; assesses learners; differentiates instruction; engages parents; documents progress
IPed Focal person	IPed coordinator	Creates an action plan related to IPED; conducts IPED-related capacity building
IP Community Elders	Cultural Adviser	Provides cultural guidance; shares oral traditions; validates materials; participates in storytelling; attends parent sessions
PTA President	Parent Coordinator	Mobilizes parent participation; supports home reading activities; coordinates community resources; organizes reading nights
Barangay Captain	Community Partner	Supports barangay reading corners; facilitates community engagement; provides venue support; mobilizes barangay resources

Based on **DepEd Order No. 43, s. 2013** (Project Development and Management Framework) and DepEd Project Management Guidelines

The SAMA-SAMA SA PAGBASA program represents a comprehensive and localized response to the findings of the study within a one-year academic timeframe. It provides a clear, realistic, and actionable roadmap for improving reading outcomes for IP learners in Magsaysay District across school and district levels. In alignment with both the results of this study and the supporting literature and studies, the design of the program is grounded on evidence that highlights the critical role of teacher competence in the literacy development of IP learners. Research consistently emphasizes that teacher preparation and professional development are critical in improving literacy outcomes. Bastida et al. (2016) revealed that IPed teachers often struggled with contextualizing lessons and strengthening literacy instruction. These findings support the teacher capability-building series in your program. Systematic assessment is another cornerstone. Romualdo (2026) reported strong correlations between intervention strategies and learners' skills, while Casingal et al. (2025, 2026) demonstrated that standardized assessments such as Phil-IRI and Dolch tests transformed struggling readers into accelerated learners. These studies justify the district-wide assessment coordination and data-driven monitoring embedded in your plan. Culturally responsive materials are equally vital. Ligoyligoy et al. (2025) showed that contextualized phonics-based workbooks enhanced engagement and comprehension among IP learners, while Mado et al. (2025) found that learners performed better on texts related to indigenous culture. These findings validate the District Reading Materials Development Hub and the integration of indigenous language and culture in instruction. Community engagement also plays a decisive role. Bardinas et al. (2026) confirmed that supportive home literacy environments significantly influenced literacy performance, while Cubillas et al. (2025) demonstrated that community-based literacy projects reduced frustration-level readers and increased independent reading achievements. These studies

underpinned the Reading Festival, Reading Caravan, and parent workshops in the program.

Finally, monitoring and technical assistance ensured fidelity of implementation. Guerrero (2025) and Pacleb (2026) highlighted that teacher-driven interventions and consistent monitoring correlated strongly with literacy outcomes. Giles (2026) further validated that remedial approaches directly influenced learners' progress. These findings supported the monthly monitoring visits and technical assistance included in the plan. The process flow of the program follows a logical cycle: it begins with a District Reading Summit to launch the initiative and align stakeholders, followed by baseline assessments to identify learner needs. Teachers then undergo quarterly training sessions on culturally responsive pedagogy and MTB-MLE, complemented by cross-visits to model schools. Simultaneously, the Materials Development Hub produces contextualized resources, while community engagement activities such as Reading Festivals and Caravans foster collaboration. Throughout the year, monthly monitoring and technical assistance ensure progress, culminating in an end-of-year evaluation that consolidates results, recognizes teachers, and refines strategies for sustainability. In summary, the proposed action plan integrates teacher development, systematic assessment, culturally responsive materials, community engagement, and continuous monitoring into a coherent process flow. This ensures that reading proficiency among IP learners in Magsaysay District will be enhanced through coordinated, evidence-based, and culturally grounded interventions.

4. Conclusions

Based on the findings presented, the following conclusions are drawn: The findings confirm that a single element does not determine foundational reading literacy factors but rather emerges from the complex interplay between instructional practices, teacher competence, home support, and learner characteristics. In terms of the extent of the foundational reading literacy factors of IP learners, language of instruction alignment plays a crucial role in learners' reading development, as the use of the mother tongue and linguistically appropriate materials supports comprehension. Teachers' preparation and practice strongly influence the development of learners' reading proficiency, as reflected by the very high level of competence in applying culturally responsive strategies and effective reading instruction. The home/community literacy environment has a strong influence on learners' reading development, with limited literacy support and exposure at home emerging as key concerns despite generally high levels of support and engagement. Learners' readiness plays a significant role in reading development, with early childhood experiences and socio-emotional readiness emerging as strong contributing factors. Overall, learners demonstrate a generally high level of preparedness, as evidenced by the level of reading proficiency of IP learners. Reading fluency among IP learners shows gradual progression across grade levels, with learners demonstrating developing skills in both Filipino and English. However, they have not yet consistently reached independent reading levels. Reading comprehension among IP learners shows steady development across grade levels, with stronger performance observed in Filipino and progressing levels of comprehension in English. Teacher preparation and language of instruction alignment both have a significant effect on reading fluency, while learners' readiness shows a positive and significant relationship with reading comprehension. However, the home/community literacy environment and its effect on reading fluency were not significant. The proposed capacity-building program serves as a strategic roadmap to a more comprehensive proposed district-based capacity-building program to enhance the reading proficiency of IP learners in Elementary IP Schools in Magsaysay Districts.

Recommendations - Based on the conclusions drawn from the study on Foundational Reading Literacy Factors and Reading Proficiency of Indigenous Learners in Magsaysay, Occidental Mindoro, the following recommendations are proposed for implementation by the Office of the Public Schools District Supervisor (PSDS), School Heads, and Elementary Teachers. The District Office may adopt a unified reading framework that integrates language alignment, teacher competence, community engagement, and learner readiness. This must be implemented through School Reading Improvement Plans. For the extent of the foundational reading literacy factors of IP learners, school principals may implement mother tongue compliance in the teachers' instruction and conduct regular classroom observations. Principals may provide monthly coaching, designate model teachers as

mentors, and ensure that instructional practices directly improve fluency and comprehension. Schools may formalize partnerships with IP elders and barangay officials to strengthen literacy through storytelling sessions, parent workshops, and barangay reading corners. Principals may conduct monthly portfolio reviews and observations to ensure teachers implement readiness-based strategies effectively, supporting diverse learner needs, such as the level of reading proficiency of IP learners. Schools may adopt a comprehensive fluency development program that begins in the early grades and continues through intermediate levels. Schools may implement a comprehensive reading program that develops and improves comprehension skills using explicit strategy instruction, small-group and individualized interventions, and enrichment activities across grade levels. School principals are encouraged to strengthen kindergarten readiness, initiate capacity-building for teachers, provide orientation to parents, and partner with IP elders. SAMA-SAMA SA PAGBASA may be implemented as a district-based capacity-building initiative in Magsaysay District and may also be adopted by other districts as a model program to enhance the reading proficiency of IP learners. Future researchers may conduct studies to track IP learners from Kindergarten to Grade 6 to examine how foundational factors interact over time. This will also evaluate the long-term effectiveness of programs like Sama-Sama sa Pagbasa across multiple schools.

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Educators' 21st-century skills and teaching performance at public secondary schools

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Abstract

This study examined the relationship between educators' 21st-century skills and teaching performance at San Jose National Agricultural and Industrial High School. Specifically, it assessed teachers' levels of creativity and innovation, information, media, and technology skills, collaboration, and critical thinking. It evaluated how these skills relate to performance ratings based on the Individual Performance Commitment and Review Form (IPCRF). An exploratory sequential design was employed, with 96 teacher-respondents participating in the study. Data were analyzed using weighted means, structural path analysis, and effect size measurements. Findings revealed that teachers generally demonstrated a very high level of 21st-century skills, with collaboration and critical thinking receiving the highest ratings. Teaching performance was predominantly rated as Outstanding, indicating strong professional competence. Structural analysis showed a statistically significant but negative relationship between creativity and innovation and teaching performance, while the effect of critical thinking on performance was not statistically significant. These results suggest that the IPCRF may primarily reward procedural compliance and routine instructional practices rather than innovative or higher-order teaching skills. The study concludes that although teachers possess the necessary 21st-century skills for modern education, current evaluation frameworks may not fully capture or reward these competencies. It is recommended that professional development programs and performance assessment tools be refined to recognize better and support innovative and reflective teaching practices.

Keywords: educators' 21st century skills, academic performance, individual performance, Commitment and Review Form (IPCRF), teachers' performance, teacher professional development

Educators' 21st-century skills and teaching performance at public secondary schools

1. Introduction

The 21st century has brought significant changes in education, requiring teachers to possess not only content knowledge but also essential competencies such as communication, collaboration, critical thinking, creativity, and digital literacy. These 21st-century skills are crucial in ensuring effective teaching and learning in a rapidly changing, technology-driven educational environment. As education systems shift toward learner-centered and technology-integrated approaches, teachers are expected to adopt innovative instructional strategies that enhance learner engagement and improve academic outcomes.

In response to these global demands, the Department of Education (DepEd) in the Philippines has implemented key policy reforms such as the K to 12 Curriculum and the Philippine Professional Standards for Teachers (PPST)(DepEd Order No. 21, s. 2019). These policies emphasize the integration of 21st-century skills in classroom instruction and highlight the importance of pedagogical practices that are constructivist, inquiry-based, reflective, and collaborative. Teachers are therefore expected to demonstrate not only mastery of subject content but also the ability to facilitate higher-order thinking skills among learners through effective instructional delivery. At the school level, particularly in San Jose National Agricultural and Industrial High School, teachers play a vital role in implementing these educational reforms. As a public secondary institution, the school serves a diverse group of learners who require adaptive and innovative teaching strategies to meet their academic needs. Teachers are expected to integrate digital tools, foster collaboration, and apply student-centered approaches to enhance classroom instruction and improve overall teaching performance. However, variations in the level of 21st-century skills among teachers may influence the effectiveness of their instructional practices and classroom outcomes. Cabahug et al. (2024) Teachers who demonstrate high levels of 21st-century skills (communication, collaboration, critical thinking, and digital literacy) also show higher teaching performance levels, particularly in instructional delivery and classroom engagement. It suggests that teachers who possess strong 21st-century skills tend to demonstrate higher levels of teaching performance, particularly in areas such as instructional delivery, classroom management, learner engagement, and assessment practices. Conversely, challenges such as limited access to training, insufficient digital resources, and workload constraints may hinder the full implementation of these competencies in actual classroom settings. These issues highlight the need to examine further the relationship between teachers' 21st-century skills and their performance within the school context.

Therefore, this study aims to determine the relationship between 21st-century skills and teachers' performance among teachers of San Jose National Agricultural and Industrial High School. The findings of this study may serve as a basis for improving instructional practices, designing targeted professional development programs, and strengthening the implementation of DepEd policies within the school. Recent systematic reviews (Manuel, 2025) show that teachers must develop strong 21st-century competencies to manage modern classrooms effectively. It was found that technology-based teacher training enhances critical thinking, creativity, communication, collaboration, and digital literacy, which are essential components of teacher effectiveness in 21st-century education. This study focused on determining 21st-century skills and teachers' performance in Public Secondary Schools. In response to the rapidly changing world, education plays a vital role in equipping students to face and engage with emerging challenges effectively.

Statement of the Problem - This study aimed to determine the relationship between 21st-century skills and teachers' performance in San Jose National Agricultural and Industrial High School. (1) What skills are consistently demonstrated by teachers who effectively implement 21st - century learning frameworks? (2)What is the level of 21st century skills demonstrated by teachers of San Jose National Agricultural and Industrial High School in terms of creativity and innovation, information, media and technology skills, collaboration and critical thinking (3) What is the level of respondents' teaching performance based on their Individual Performance

Commitment and Review Form (IPCRF) (4) Is there a significant relationship between the teachers' 21st century skills and their teaching performance? (5) What Instructional Development Plan may be formulated to improve the teachers' 21st-century skills and their teaching performance?

Significance of the Study - This study concerning the 21st-century skills and teachers' performance would greatly benefit the following: first, the Head Teacher and Master Teachers. The study will eventually benefit the head teachers and master teachers, since the results may provide new opportunities to develop teaching strategies for the improvement of the 21st-century skills of teachers. Learners, as the primary beneficiaries of this study, may provide new opportunities for improvement. Better teacher inputs are better student outputs. The Local Government Unit of San Jose serves as a basis for planning and implementing programs that support teachers' professional development. The parents are one of the key stakeholders in education who influence how these skills are understood, valued, and operationalized in children's learning. The Public Secondary Teachers, the result of this study may help them determine specific areas for improvement when it comes to teaching skills and strategies that contribute to enhancing teaching performance, the School Administrations and Supervisors. The study serves as a basis for identifying 21st-century skills and teachers' performance, and it will help them develop necessary actions in helping their teachers improve their performance that will, in effect, reflect their management and administrative performances. For Teacher Education Institutions, this study can be helpful in developing their educational programs on enhancing 21st-century skills and teachers' performance. Moreover, finally, Future Researchers, the conducted studies will further open doors for future researchers to expand studies in relation to 21st-century skills and teachers' performance.

Scope and Delimitation of the Study - This study was focused on determining the teachers' 21st-century skills and their teaching performance. Specifically, it examines key skill areas such as creativity and innovation, information, media and technology skills, collaboration, and critical thinking, and how these relate to teachers' effectiveness in the classroom. The respondents of the study are the teachers of San Jose National Agricultural and Industrial High School during the School Year 2025–2026. Data are gathered using a structured questionnaire and relevant school records to assess both 21st-century skills and teaching performance. The study is limited to a selected 96 teachers within the said institution and does not include students, parents, or teachers from other schools. It also focused only on measurable indicators of teaching performance based on existing evaluation tools, the Individual Performance Commitment and Review Form (IPCRF), and does not cover other factors such as personal life, psychological conditions, or external socio-economic influences. The main purpose of the study was to identify the relationship between the 21st-century skills and teachers' performance. It used an exploratory sequential research design, resulting in over a month of data collection.

2. Methodology

Research Design - This mixed-methods research used an exploratory sequential research design, integrating both qualitative and quantitative approaches to comprehensively investigate the 21st-century skills of the teachers in San Jose National Agricultural and Industrial High School. In the qualitative phase, the researcher gathered detailed information about teachers' 21st-century skills and teachers' performance through survey questions. This phase aims to explore teachers' experiences, perceptions, and practices in developing and applying 21st-century skills such as creativity and innovation, information, media and technology, collaboration, and critical thinking. The data collected in this phase were analyzed to identify common themes and patterns. These findings served as the basis for developing a quantitative research instrument, such as a structured questionnaire (Creswell & Clark, 2017).

In the quantitative phase, the developed instrument was administered to a larger group of respondents. This phase aims to measure and determine the level of teachers' 21st-century skills and their relationship to teaching performance. Statistical analysis was used to interpret the data and identify significant relationships between variables. Finally, the results from both qualitative and quantitative phases were integrated to provide a more comprehensive understanding of how teachers' 21st-century skills influence their teaching performance. The

exploratory sequential design allows the researcher first to understand the phenomenon in depth and then to validate and quantify the findings, making the results more reliable, meaningful, and contextually grounded.

Respondents of the Study - The respondents of this study were the 96 permanent secondary school teachers of San Jose National Agricultural and Industrial High School for the school year 2025–2026. The respondents were selected through complete enumeration, wherein all members of the target population were included in the study. Since the population size was manageable and accessible, every permanent teacher was considered a respondent to ensure a complete and accurate representation of the entire teaching workforce of the school. This approach was used to obtain more reliable and comprehensive data regarding the teachers’ 21st-century skills and teachers’ performance, as it eliminates sampling bias and ensures that all eligible teachers are given equal opportunity to participate in the study.

Research Instrument - The main instrument used in this study is a researcher-made survey questionnaire designed to determine the level of teachers’ 21st-century skills in relation to their teaching performance. The questionnaire consists of four indicators of the 21st-century skills, namely: creativity and innovation, information, media and technology skills, collaboration, and critical thinking skills. A total of 40 items are included in the instrument, distributed as follows: Creativity and Innovation – 10 items; Information, Media, and Technology Skills – 10 items; Collaboration – 10 items; and Critical Thinking Skills – 10 items. The 40-item questionnaire was tested for reliability using the split-half method. After having administered the research instrument to 30 respondents from Pedro T. Mendiola Sr. Memorial National High School, the reliability of the instrument was evaluated using the Split-Half test to determine the internal consistency of four key domains of the 21st-century skills demonstrated by the teachers. The reliability is determined by the Spearman-Brown coefficient, which estimates the reliability of the full-length test based on the halves. The Split-Half method divides the items into two sets, odd-numbered and even-numbered items, to see how well the two halves correlate. The analysis by domain is presented in Table 1 based on coefficients of equal length. The respondents answered using a 5-point Likert Scale, as follows: 5 Very Highly Agree (VHA), 4 Highly Agree (HA), 3 Moderately Agree (MA), 2 Least Agree (LA), and 1 Disagree (D). The respondents placed a check (✓) on the corresponding scale that best describes their level of agreement for each statement. Each response was assigned a numerical value from 1 to 5. The total score for each indicator was computed and divided by the number of items to obtain the weighted mean. The overall mean was used to determine the level of teachers’ 21st-century skills.

Table 1
Results of the Reliability Analysis for Teachers. 21st Century Skills

Items	Number of Items	Reliability Coefficients*	Analysis
21st Century Skills Demonstrated by Teachers (10 items each)			
1. Creativity and Innovation	10	0.866	High Reliability
2. Information, Media, and Technology Skills	10	0.941	Very High Reliability
3. Collaboration	10	0.959	Very High Reliability
4. Critical Thinking	10	0.956	Very High Reliability

*Based on coefficients of equal length

Across all domains, the Spearman-Brown coefficients ranged from .866 to .959. These coefficients exceeded the common reliability threshold of .70, which is generally considered reliable. Therefore, the instrument demonstrates a very high internal consistency and reliability for measuring these specific skills. The instrument is considered a consistent and dependable tool for data collection.

Data Gathering Procedure - For the qualitative data, upon the approval of the school principal, the researcher used an interview guide and gathered data online through a group chat in the Messenger application over a five - day data collection cycle. The collected responses were transcribed and transferred to a Word document, ensuring that each transcript was properly labeled and organized to facilitate accurate and systematic analysis. The researcher then proceeded to read the data carefully while taking down notes of the emergent ideas, patterns, and insights observed. This was followed by the coding process, where the researcher assigned colors to each theme and developed headings based on relevant text excerpts grouped under their respective themes. Finally, the

researcher developed a thematic analysis through a diagram to highlight the basis of the quantitative analysis following the technique. For the quantitative data, the researcher administered an online survey questionnaire using Google Forms. Prior to its administration, the instrument was pilot-tested to ensure reliability and validity. Upon approval of the school principal for the conduct of the reliability test, the survey was disseminated to the target respondents and was conducted within a five-day data collection cycle to ensure adequate response time. All responses were automatically recorded and organized for statistical analysis. The collected data were automatically organized into a spreadsheet, ensuring accurate and efficient recording. The researcher then conducted data cleaning to detect and correct any missing or inconsistent responses. Subsequently, the data underwent descriptive statistical analysis. To examine the relationships among variables, inferential statistical techniques such as correlation and regression analysis were performed with the assistance of a statistician. Finally, the findings were then visualized through a table to aid their interpretation. This process was also adhered to Creswell's (2014) framework for quantitative research, ensuring systematic and reliable analysis.

Statistical Treatment of Data - The following statistical tools were utilized to address the research problems. The weighted mean was employed to describe the 21st-century skills of the teacher-respondents. For inferential analysis and hypothesis testing, Partial Least Squares–Structural Equation Modeling (PLS-SEM) was applied, with results generated using WarpPLS version 7.0. In describing the responses, frequency and percentage distribution were also used. A five-point Likert scale was adopted to interpret the level of responses, where a mean score of 4.20–5.00 indicated a very high level, 3.40–4.19 a high level, 2.60–3.39 a moderate level, 1.80–2.59 a low level, and 1.00–1.79 a very low level. Furthermore, the interpretation of the effect size of the path coefficient (β) was based on established thresholds: a value of 0.02 was considered small, 0.15 as medium, and 0.30 as large.

Ethical Consideration - The researcher complied with the research guidelines provided by the Graduate School of the Divine Word College of San Jose. The purpose of the study and the participation of the respondents were first explained before administering the questionnaire. The data gathering took two weeks to complete, during which the respondents' confidentiality of information and /or answers and their anonymity were maintained throughout the data collection, analysis, and presentation of findings. It was ensured that all data and results collected were solely used for the study. The American Psychological Association (APA), 7th Edition, was employed to give credit to the authors of research studies used as references. On the other hand, previous studies and sources that were used as bases for this study were properly cited and acknowledged. This study contributes to the education sector and carries no risk to anyone involved in its conduct.

3. Results and Discussion

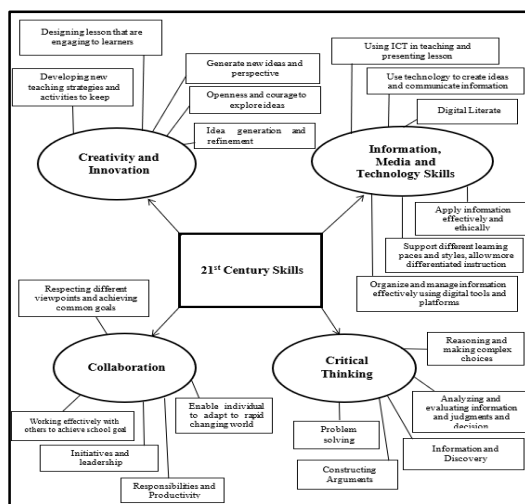


Figure 1. Initial Thematic Map for 21st Century Skills

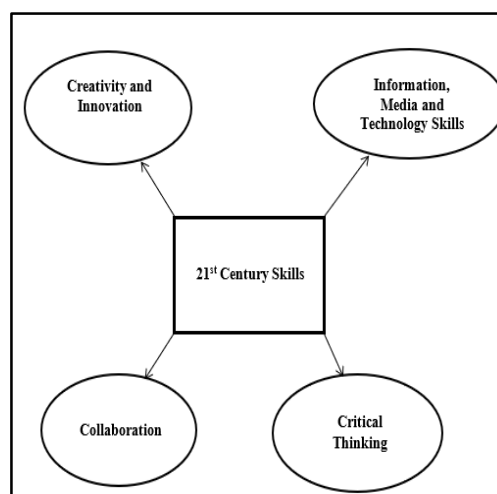


Figure 2. Final Thematic Map for 21st Century Skills

For the qualitative approach, the researcher conducted interviews with teachers, who were asked about the 21st-century skills that they have. The responses were carefully reviewed and familiarized with the data. Common responses were transcribed and coded, and the coded transcripts were then organized into themes. This study revealed that 21st-century skills are common among teachers. The responses are designing lesson that are engaging to learners, Developing new teaching strategies and activities to keep, generate new ideas and perspective openness and courage to explore ideas, idea generation and refinement, using ICT (Information Communication Technology) in teaching and presenting lesson, use technology to create ideas and communicate information, digital literate, apply information effectively an ethically, support different learning paces and styles, allow more differentiated instruction, organize and manage information effectively using digital tools and platforms, reasoning and making complex choices, analyzing and evaluating information and judgment and decision, information and discovery, constructing arguments problem solving, enable individual to adapt to rapid changing world, responsibilities and productivity, initiative and leadership, working effectively with others to achieve school goal, respecting different viewpoints and achieving common goals. Voogt and Knezek's (2024) systematic review on ICT integration in secondary education found that the effective use of technology in teaching depends not only on access to tools but also on teachers' attitudes, motivation, and pedagogical knowledge. The study stressed that successful integration occurs when technology is aligned with learning objectives and supported by appropriate skills development. The four emerging themes presented in Figure 2 —creativity and innovation, information, media and technology skills, critical thinking, and collaboration—served as the foundation for the development of the research questionnaire. These themes reflect the core domains of 21st-century skills, which are consistently emphasized in contemporary educational research as essential competencies for effective teaching and learning in modern classrooms. Brown et al. (2024) emphasized that creativity is fostered through student-centered and innovative teaching approaches that respond to diverse learners' needs. Voogt et al. (2024), ICT competence is a multi-dimensional construct that includes information literacy, communication, digital content creation, and problem-solving. Demircioglu et al. (2023) explained that learners develop critical thinking skills when they are engaged in discussion, argumentation, and problem-solving activities. Gillies (2024) emphasized that collaboration enhances both academic and interpersonal skills by encouraging students to engage in cooperative problem-solving and collective knowledge construction.

Table 2
Mean Level of Teachers' 21st Century Skills in terms of Creativity and Innovation, and Information Media and Technology Skills

Creativity and Innovation	Weighted Mean	Interpretation
1. I can give my own interpretations of ideas.	4.39	Very High
2. I employ a variety of techniques to ensure a smooth flow of learning.	4.43	Very High
3. I enjoy doing exceptional things.	4.24	Very High
4. I have a broad imagination.	4.21	Very High
5. I incorporate educational digital resources like TikTok.	3.82	High
6. I look beyond what I see; I am open to new ideas.	4.63	Very High
7. If I do not understand something, I ask my superior.	4.77	Very High
8. I always encourage learners to be creative.	4.76	Very High
9. I can do beyond what is expected of me.	4.39	Very High
10. I can simplify the explanation when somebody asks me about something.	4.30	Very High
Composite Mean	4.39	Very High
Information, Media, and Technology Skills		
1. I can do activities using my computer skills.	4.42	Very High
2. I often do activities using different technologies.	4.14	High
3. I find E-learning effective when applied in lectures.	4.43	Very High
4. I have computer skills that help me prepare the lesson effectively.	4.42	Very High
5. I often use the internet to formulate my lesson plans.	4.26	Very High
6. I take advantage of technological developments to support my presentation.	4.42	Very High
7. I benefit much from technology.	4.58	Very High
8. I can easily detect fake news in a social media posting.	3.90	Very High
9. I use innovative technological developments for teaching strategies.	4.34	Very High
10. I teach more easily with the help of different social media platforms.	4.20	Very High
Composite Mean	4.31	Very High

legend: 4.20-5.00 Very High Level; 3.40-4.19 High Level; 2.60-3.39 Moderate Level; 1.80-2.59 Low Level; 1.00-1.79 Very Low Level

Table 2 presents the weighted mean distribution of teachers' responses on creativity and innovation, one of the indicators of 21st-century skills. Overall, the results reveal a composite mean of 4.39, which is interpreted as Very High. This indicates that teachers demonstrate a strong level of creativity and innovation in their teaching practices. In connection with that, Suyuti (2024) stressed that integrating creativity and innovation in education leads to improved learning quality, increased student engagement, and better preparation for future workforce demands. The findings suggest that an education system that promotes innovation helps learners become adaptable and competitive in a rapidly changing global environment. Isaacson (2025) highlighted that creativity in the classroom is strengthened when teachers adopt flexible and innovative instructional strategies that cater to the diverse needs of learners. Overall, the findings imply that teachers possess strong creativity and innovation skills, particularly in idea generation, adaptability, and student engagement. However, there is still a need to further enhance further their competence in using digital resources to optimize innovative teaching within the context of 21st-century education fully.

Moreover, teachers demonstrate a very high level of information, media, and technology skills, particularly in terms of technology utilization, digital resource integration, and instructional innovation. Nevertheless, strengthening teachers' critical evaluation of digital content and expanding their use of varied technologies could further enhance their effectiveness in delivering 21st-century education. This indicates that while teachers are fairly proficient in using technology, they may need additional support in media literacy, particularly in critically evaluating digital content, a concern noted in recent studies that identify digital discernment as an ongoing challenge for many educators. Hobbs & Coiro (2022). Additionally, expanding the range and depth of technology use beyond basic routines can further improve instructional innovation (Kimmons & Hall, 2023). Overall, the findings suggest that teachers demonstrate a very high level of information, media, and technology skills, particularly in technology utilization and digital integration. Nevertheless, there is a continued need for targeted professional development in media literacy and diversified technology use to support 21st-century teaching and learning fully.

Table 4
Mean Level of Teachers' 21st Century Skills in terms of Collaboration and Critical Thinking

Collaboration	Weighted Mean	Interpretation
1. I enjoy participating in decision-making.	4.59	Very High
2. I listen well when someone is giving instructions.	4.64	Very High
3. I respect each other's responsibilities	4.76	Very High
4. I feel comfortable sharing my opinions with my fellow teachers without fear of negative consequences.	4.59	Very High
5. I understand how my work directly contributes to the overall success of our school.	4.68	Very High
6. I show my ideas to others to come up with a joint decision.	4.57	Very High
7. I consider the suggestions of my fellow teachers.	4.53	Very High
8. I actively participate in group discussions.	4.73	Very High
9. I work to build consensus within my group when making decisions.	4.41	Very High
10. I am comfortable working with my fellow teachers.	4.69	Very High
Composite Mean	4.62	Very High
Critical Thinking		
I can see the pros and the cons before I make a decision.	4.59	Very High
I can decide whatever is good in myself as a teacher.	4.61	Very High
I consider circumstances before making decisions.	4.66	Very High
I consider whatever is best for every learner.	4.49	Very High
I can assist my colleagues in making the right decisions.	4.53	Very High
I evaluate situations objectively before making a decision.	4.26	Very High
I can evaluate my students' outputs.	4.57	Very High
I can analyze classroom situations.	4.78	Very High
I accept my failure.	4.69	Very High
I perform my task fairly, considering the students' individual differences.	4.82	Very High
Composite Mean	4.60	Very High

Legend: 4.20-5.00 Very High; 3.40-4.19 High; 2.60-3.39 Moderate; 1.80-2.59 Low; 1.00-1.79 Very Low

Table 4 shows the mean scores for teachers' 21st-century skills in terms of collaboration. The composite mean of 4.62, interpreted as "Very High," indicates that teachers consistently demonstrate strong collaborative skills in

the school environment. It shows that teachers possess strong collaboration skills, demonstrated by active participation, respectful communication, and shared responsibility. Such high collaboration fosters cohesion, professional trust, and effective problem-solving, which are essential for achieving school-wide goals and supporting student success. Overall, these results suggest that teachers' collaboration skills significantly contribute to a positive school culture and collective professional efficacy, aligning with recent studies emphasizing collaboration as a core 21st-century competency. Johari et al. (2022); Trust (2021). Moreover, in terms of critical thinking skills. The composite mean of 4.60, interpreted as "Very High," indicates that teachers consistently demonstrate strong critical thinking abilities in their professional practice. These scores indicate that teachers are self-aware, reflective, and capable of analyzing complex situations to make informed, objective decisions. Overall, high levels of critical thinking among teachers support better problem-solving, decision-making, and reflective practices in schools, which are essential for effective 21st-century teaching (Schleicher,2023). The study yielded several significant findings. First, in identifying the skills consistently demonstrated by teachers who effectively implement 21st-century learning frameworks, interview responses were grouped into four major themes: creativity and innovation, information, media and technology skills, collaboration, and critical thinking. These themes highlight the essential competencies that enable teachers to adapt to modern educational demands. Second, the level of 21st-century skills demonstrated by teachers of San Jose National Agricultural and Industrial High School was found to be very high across all dimensions. Specifically, creativity and innovation obtained a weighted mean of 4.39, while information, media, and technology skills registered a weighted mean of 4.31. Collaboration recorded the highest among the four dimensions with a weighted mean of 4.62, and critical thinking also showed a very high level with a weighted mean of 4.60. These results indicate that teachers possess strong competencies in key areas required for 21st-century teaching. Third, in terms of teaching performance based on the Individual Performance Commitment and Review Form (IPCRF), the majority of teachers achieved an Outstanding rating. A total of 91 respondents, or 94.8%, fell within the rating range of 4.500–5.000, while only 5 respondents, or 5.2%, obtained a Very Satisfactory rating ranging from 3.500–4.499. This suggests that most teachers demonstrate a high level of professional performance. Fourth, the findings revealed a significant relationship between teachers' 21st-century skills and their teaching performance. Teachers who exhibit high levels of creativity and innovation are more likely to design engaging, flexible, and learner-centered activities aligned with IPCRF performance indicators. Likewise, strong critical thinking skills enable teachers to effectively analyze student needs, address classroom challenges, and make informed instructional decisions.

Finally, an Instructional Development Plan (IDP) was proposed to enhance teachers' competencies and performance further. The plan focuses on strengthening 21st-century skills, particularly in creativity and innovation, as well as critical thinking. It includes specific objectives, structured activities, designated persons involved, timelines, expected outcomes, and corresponding budget allocations. Overall, the plan is designed to improve instructional quality and ensure that teachers are better equipped to meet the evolving demands of modern education.

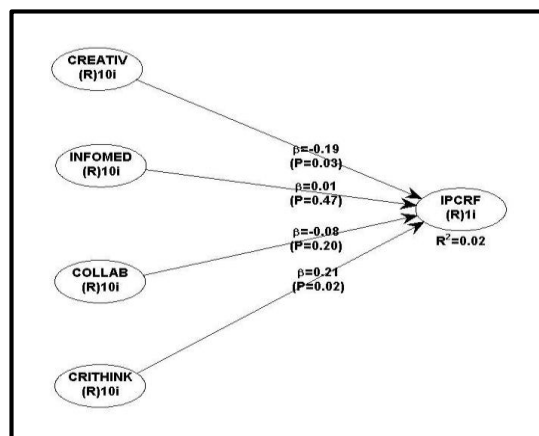


Figure 3. Structural Model of the Relationship Between 21st Century Skills of Teachers and Teaching Performance

The hypothesized relationship between the variables in the study is presented through a structural model displayed in Figure 5. The exogenous variable, 21st century skills, is described by creativity and innovation (CREATIV), information, media, and technology skills (INFOMED), collaboration (COLLAB), and critical thinking (CRITHTINK). These variables are directly linked to the endogenous variable, teaching performance, which is measured by IPCRF rating. These four combined skills reveal low explanatory power ($R^2=0.02$), explaining only 2% of the variance in teaching performance (IPCRF). This confirms that 98% of what determines a teacher's IPCRF score comes from factors not included in this model, such as school resources or administrative support. The strength of the influence of these skills generates beta coefficients from 0.01 to 0.21. The significance of the strength yielded p-values from .02 to .47, with two values exceeding the .05 significance threshold. Darling-Hammond et al. (2024) explain that instructional effectiveness is strongly dependent on systemic factors such as curriculum structure, institutional expectations, and support mechanisms, rather than teacher skills alone.

Table 5
Path Coefficients and p-values for Ho

Path	Beta (β) Coefficient	p-value*	Interpretation
Ho: 1st Century Skills→Teaching Performance (IPCRF)			
CREATIV→IPCRF	-0.187	0.028	Significant
INFOMED→IPCRF	0.008	0.467	Not Significant
COLLAB→IPCRF	-0.084	0.202	Not Significant
CRITHTINK→IPCRF	0.207	0.017	Significant

*Significant at $p < .05$

Table 5 presents the structural paths between four dimensions of 21st Century Skills and Teaching Performance (IPCRF). The statistical significance is determined by the p-value, using the standard alpha threshold of 0.05. Critical thinking skills appear to be the highest positive predictor ($\beta=0.207$, $p=0.017$). Since $p < 0.05$, there is a statistically significant positive relationship between critical thinking skills and teaching performance. This suggests that teachers who demonstrate higher levels of logical reasoning and problem-solving tend to receive higher IPCRF ratings. The findings of the structural path analysis revealed that among the four dimensions of 21st Century Skills, critical thinking skills emerged as the highest positive predictor of teaching performance as measured by the Individual Performance Commitment and Review Form (IPCRF) ($\beta = 0.207$, $p = 0.017$). Since the p-value is less than the standard alpha level of 0.05, the relationship is considered statistically significant. This indicates that teachers who demonstrate higher levels of logical reasoning, analytical thinking, and problem-solving abilities tend to achieve higher performance ratings in the IPCRF. The result suggests that the capacity of teachers to analyze situations, make sound instructional decisions, and address classroom challenges effectively contributes positively to their overall teaching performance.

Meanwhile, the teachers' skill in creativity and innovation shows a significant but negative relationship ($\beta=-0.187$, $p=0.028$). Because $p < 0.05$, the relationship is statistically significant. However, the negative coefficient indicates that higher self-reported or measured creativity scores are associated with a slight decrease in IPCRF ratings in this model. The findings indicate that creativity and innovation skills have a statistically significant but negative relationship with teaching performance as measured by the Individual Performance Commitment and Review Form (IPCRF) ($\beta = -0.187$, $p = 0.028$). Since the p-value is lower than the standard alpha level of 0.05, the relationship is considered statistically significant. However, the negative beta coefficient suggests that higher levels of self-reported creativity and innovation are associated with a slight decrease in IPCRF ratings within the model. This implies that while teachers may demonstrate creative and innovative practices, these may not be strongly reflected or emphasized in the current performance evaluation criteria, potentially leading to lower or less directly aligned IPCRF ratings. Surprisingly, collaboration and information, media, and technology skills both failed to reach significance. Collaboration ($\beta=-0.084$, $p=0.202$) and Information Literacy ($\beta=0.008$, $p=0.567$) both have p-values greater than 0.05. This indicates that, for this group of teachers, these two skills do not have a significant impact on their teaching performance ratings.

The findings revealed that creativity and innovation skills have a statistically significant but negative relationship with teaching performance as measured by the Individual Performance Commitment and Review

Form (IPCRF) ($\beta = -0.187, p = 0.028$). Since the p-value is less than the standard alpha level of 0.05, the relationship is considered statistically significant. However, the negative beta coefficient indicates that higher levels of self-reported creativity and innovation are associated with a slight decrease in IPCRF ratings in the model. This suggests that although teachers may demonstrate creative and innovative practices in their teaching, these competencies may not be fully captured or emphasized in the current performance evaluation criteria used in the IPCRF, which may explain the observed negative association. These results lead to the decision to partially reject the null hypothesis of no significant relationship between the teachers' 21st-century skills and their teaching performance. This confirms that there is no significant relationship between 21st-century skills and teaching performance. The findings suggest that the current performance tool (IPCRF) prioritizes standardized procedures over creative instructional methods. Vasquez Montoya et al.(2025) study found that creativity and innovation play a crucial role in enhancing learners' cognitive, emotional, and intellectual development. However, it also highlighted that many educators still struggle to effectively apply creative approaches in teaching, indicating a gap between theory and practice.

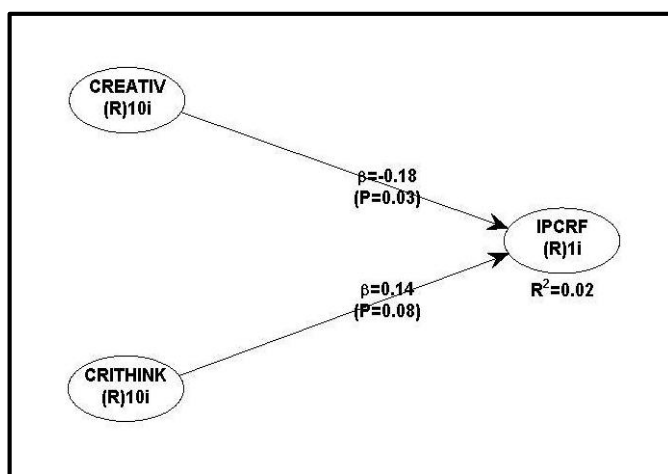


Figure 4. Emerging Model of the Relationship Between 21st Century Skills of Teachers and Teaching Performance

The emerging model in Figure 4 represents a refined version of the structural analysis, focusing only on the variables that demonstrated the most relevant influence on teachers' performance (IPCRF). In this new model, two non-significant paths have been removed to show a clearer picture of the final results. Even with the model refined, the R2 remains at 0.02. This means that creativity, innovation, and critical thinking together only account for 2% of the variance in teaching performance. Since the model only explains 2% of the performance, it can be noted that 21st-century skills, while theoretically important, are not the primary measures by which teachers are currently being officially evaluated. Voogt et al. (2024) highlight that 21st-century skills such as creativity and critical thinking are primarily reflected in instructional processes rather than formal evaluation metrics, which may not fully capture their influence in standardized performance systems.

Table 6
Beta Coefficients of the Paths and p-values for Ho2

Paths	Beta Coefficient (β)	p-value*	Standard Error	Effect Size**	Interpretation
Ho: 1st Century Skills→Teaching Performance (IPCRF)					
CREATIV→IPCRF	-0.180	.033	.097	.017	Small
CRITHINK→IPCRF	0.141	.076	.098	.004	Negligible

*Significant at $p < 0.05$

** Effect size coefficient: 0.02 – small, 0.15 – medium, 0.30 – large

Table 6 discloses the beta coefficients of the paths in the emerging model with the corresponding p-values. The structural analysis evaluates the predictive impact of two specific 21st-century skills on teaching performance (IPCRF). The path CREATIV→IPCRF is statistically significant, showing a beta coefficient of -0.180 ($p = .033$),

confirming an inverse relationship. Furthermore, the effect size of .017 is interpreted as small, falling just below the 0.02 threshold for a standard "small" effect. This suggests that while the relationship exists, its practical impact on performance ratings is limited. Also, in relation to the emerging model, which examines the predictive relationship between selected 21st-century skills and teaching performance as measured by the Individual Performance Commitment and Review Form (IPCRF). The structural analysis indicates that creativity and innovation significantly predict teaching performance, as evidenced by the path $CREATIV \rightarrow IPCRF$, which yielded a beta coefficient of -0.180 with a p-value of .033. Since the p-value is lower than the 0.05 level of significance, the result suggests that the relationship between creativity and innovation and teaching performance is statistically significant.

However, the negative beta coefficient indicates an inverse relationship, implying that higher levels of reported creativity and innovation are associated with slightly lower teaching performance ratings based on the IPCRF. This unexpected direction of the relationship may be explained by the nature of the current performance evaluation system, which tends to emphasize standardized teaching procedures, documentation, and compliance with prescribed indicators rather than creative or innovative instructional approaches. As a result, teachers who apply more experimental or innovative strategies in the classroom may not necessarily receive higher ratings within the existing evaluation framework. Moreover, the effect size of 0.017 is interpreted as small, falling just below the commonly accepted threshold of 0.02 for a small effect. This indicates that although the relationship between creativity and innovation and teaching performance is statistically significant, its practical influence on IPCRF ratings is minimal. Therefore, creativity and innovation may not be a major determinant of teachers' performance scores within the current evaluation system. These findings imply that while creativity and innovation are recognized as essential competencies in 21st-century education, they may not be strongly reflected in formal performance assessment tools. This suggests the need for evaluation frameworks that better capture and value innovative teaching practices alongside traditional performance indicators. The path from critical thinking to IPCRF ($\beta=0.141$) is not statistically significant and yielded a .076 p-value exceeding the 0.05 threshold. The effect size of .004 is considered negligible. This indicates that, in this refined model, critical thinking skills do not reliably predict teaching performance scores for this group of teacher-respondents.

The structural analysis also examined the predictive relationship between critical thinking skills and teaching performance as measured by the IPCRF. The path from Critical Thinking \rightarrow IPCRF yielded a beta coefficient of 0.141 with a p-value of 0.076, which exceeds the conventional significance threshold of 0.05. This indicates that the relationship is not statistically significant, meaning that, for this sample, variations in critical thinking skills do not reliably predict differences in teaching performance ratings. In addition, the effect size of 0.004 is considered negligible, suggesting that even if there were a relationship, its practical impact on performance outcomes is minimal. This result implies that teachers' ability to apply critical thinking in instructional design, problem-solving, or decision-making may not be captured or rewarded by the current performance evaluation system (IPCRF), which primarily emphasizes compliance with standardized procedures and documentation rather than the demonstration of higher-order thinking skills.

Overall, these findings suggest that, within the current framework, critical thinking skills do not play a significant role in determining teaching performance scores, highlighting a potential gap between the competencies valued in 21st-century teaching and those measured by formal performance evaluation tools. It underscores the need for evaluation frameworks that better recognize and reward analytical and reflective teaching practices. The standard errors yielded .097 and .098, representing the estimated standard deviation of the path coefficients. These values measure how much the coefficient value would likely vary if the study is repeated with a different sample of teachers from the same population. Both values are quite similar and relatively low, under .10, indicating that the measurement of these relationships is fairly consistent. The standard errors for the estimated paths in the emerging model were 0.097 and 0.098, which represent the standard deviation of the path coefficients. These relatively low and nearly identical values indicate that the estimates are stable and consistent, suggesting that the observed relationships between 21st-century skills and teaching performance would likely be similar if the study were repeated with another sample of teachers from the same population. In other words, the measurements in the

model are reasonably reliable. Conversely, the path from critical thinking to IPCRF was not statistically significant, and the effect size was negligible, suggesting that critical thinking skills do not meaningfully influence teaching performance scores in this model. This indicates that the IPCRF may not be a sensitive tool for capturing 21st-century teaching competencies, particularly those that emphasize higher-order thinking and innovation.

Overall, these findings imply that while 21st-century skills such as creativity and critical thinking are essential for modern teaching, the IPCRF appears to favor procedural compliance and routine instructional practices over innovative or reflective teaching approaches. In practice, this means that teachers who excel in applying creative strategies or critical thinking in their instruction may not see these strengths reflected in their performance ratings, highlighting a potential misalignment between contemporary teaching competencies and existing evaluation criteria. In the Philippine context, the IPCRF under the PPST framework focuses heavily on standardized indicators, which may not fully capture innovative and reflective teaching practices. These studies collectively support the implication that there is a potential misalignment between 21st-century teaching competencies and existing teacher performance evaluation systems. Department of Education. (2017). Philippine Professional Standards for Teachers (PPST). Similarly, recent literature highlights that teacher evaluation systems grounded in standardized frameworks tend to emphasize measurable and procedural aspects of teaching performance, potentially overlooking greater pedagogical skills. Kraft and Gilmour (2024) explain that many teacher evaluation models prioritize compliance with set indicators and observable classroom practices, which can reduce the recognition of innovative and higher-order teaching behaviors. As a result, teachers who employ creative or reflective instructional strategies may not receive differentiated recognition in formal evaluation systems. Voogt et al. (2024) further argue that competencies such as creativity and critical thinking are embedded within instructional processes and learner engagement, making them less visible in structured evaluation rubrics like IPCRF. This reinforces the idea that while teachers may demonstrate high levels of these skills in practice, such competencies may not be fully captured in standardized rating systems.

Table 7

Proposed Action Plan to Improve Teachers’ 21st Century Skills and Their Teaching Performance

Area of Development	Objectives	Key Activities	Persons Involved	Time-line	Expected Outcome	Budget/ Resources
1. Creativity & Innovation	Encourage innovative teaching methods	- Demonstration teaching- Innovation contests (best teaching strategy)- Use of multimedia and interactive tools	Teachers, School Head	Semi-annual	More engaging and creative classroom practices	P 3,000.00 (materials, rewards, printing).
2. Information, Media & Technology Skills	Improve teachers’ ability to use ICT tools in teaching	- Conduct ICT Training workshops (e.g, Google Classroom, LMS) - Peer mentoring on tech integration -Develop digital lesson plans	School Head, ICT Coordinator-Tor, Teachers	Quarterly	Increased use of technology in instruction, improved student engagement	P 5,000.00 (training materials, internet support, token).
3. Collaboration Skills	Strengthen teamwork and professional collaboration	- Learning Action Cell (LAC) sessions- Collaborative lesson planning- Team teaching activities	Master Teachers, Teachers	Monthly	Improved teamwork and shared best practices	P 3,000.00 (refreshment, documentation, materials).
4. Critical Thinking	Develop higher-order thinking teaching strategies	- Workshops on inquiry-based and problem-based learning- Case study analysis sessions	Instructional Leaders	Semi-annual	Improved ability to design engaging and analytical lessons	P 7,000.00 (training kits, resource materials, speaker honorarium).

The proposed development plan highlights two key areas of teacher development: Creativity and Innovation

and Critical Thinking, both of which are essential 21st-century skills that directly influence instructional quality and learner engagement. The structured activities, timelines, and expected outcomes reflect a systematic approach to strengthening teachers' pedagogical competencies in line with modern educational demands. Brown et al. (2024) explained that creativity in education is developed when teachers are given opportunities to experiment with new approaches, reflect on their practice, and integrate student-centered instructional methods. The inclusion of multimedia tools also aligns with Voogt et al. (2024), who highlighted that digital resources can enhance instructional creativity when properly integrated into teaching practice.

4. Conclusions

Based on the summary of findings, several conclusions were drawn from the study. First, the essential 21st-century skills demonstrated by teachers can be categorized into four core themes: creativity and innovation, information, media and technology skills, collaboration, and critical thinking. These themes reflect that 21st-century educators possess multidimensional competencies necessary for effective and modern teaching practices. Second, the level of 21st-century skills demonstrated by teachers of San Jose National Agricultural and Industrial High School is consistently high across all areas. In terms of creativity and innovation, teachers exhibit strong capabilities in designing engaging lessons, applying varied instructional strategies, and fostering creativity among learners.

With regard to information, media, and technology skills, teachers demonstrate competence in utilizing digital tools and integrating technology into instruction, enabling them to enhance lesson delivery and support student engagement. In collaboration, teachers display strong teamwork and interpersonal skills, actively engaging in idea-sharing, cooperative decision-making, and professional collaboration. Similarly, in critical thinking, teachers show a high level of competence in analyzing situations, making informed decisions, and effectively integrating technology to improve instructional practices and student learning outcomes. Third, although the majority of teachers achieved an Outstanding rating in their teaching performance, a small percentage received a Very Satisfactory rating. This indicates that while overall teaching effectiveness is high, there remains a need to provide additional professional support and development opportunities for some teachers to enhance their performance further. Fourth, the findings suggest the need to revisit and possibly enhance the Individual Performance Commitment and Review Form (IPCRF) framework to reflect better the holistic competencies required of 21st-century educators. Incorporating indicators that explicitly measure creativity, collaboration, and information literacy may lead to a more balanced and authentic evaluation of teacher performance, in line with global recommendations for comprehensive and future-oriented assessment systems. Finally, the proposed action plan serves as a strategic and responsive intervention aimed at addressing identified gaps and supporting the continuous professional development of teachers. Its implementation is expected to promote more innovative, collaborative, and effective teaching practices, ultimately contributing to improved student learning outcomes.

Recommendations - Based on the findings and conclusions of the study, several recommendations are proposed to enhance teachers' 21st-century skills and their overall teaching performance. Since teachers have already demonstrated strong competencies in creativity and innovation, information, media, and technology skills, collaboration, and critical thinking, schools need to sustain and strengthen these areas through continuous professional development programs. This may be achieved by conducting regular training sessions, workshops, and seminars that focus on deepening teachers' mastery of these competencies and ensuring their consistent integration into classroom instruction. Moreover, schools are encouraged to foster a culture of innovation and collaboration by organizing peer-sharing sessions and establishing professional learning communities.

To further improve specific skill areas, institutions may adopt targeted strategies. In terms of creativity and innovation, teachers may be encouraged to integrate more student-centered and engaging approaches such as project-based learning, gamification, and the use of creative multimedia tools. School administrators can support these efforts by providing appropriate instructional materials, training on digital creativity platforms, and recognition programs that motivate teachers to design innovative learning experiences. With regard to information,

media, and technology skills, teachers should be given continuous opportunities to explore modern educational platforms, learning management systems, and emerging technologies. This can be supported by improving ICT infrastructure and ensuring the availability of technical assistance to facilitate effective technology integration in teaching and learning processes. In the area of collaboration, schools may continue strengthening Learning Action Cell (LAC) sessions, mentoring programs, and team teaching initiatives. Encouraging regular peer collaboration and shared lesson planning can help sustain a strong professional learning community and enhance instructional practices across departments. Meanwhile, to develop critical thinking skills, teachers may benefit from additional training on higher-order thinking strategies such as inquiry-based learning, problem-based learning, and case analysis. School leaders may also promote reflective teaching practices to enable teachers to assess and improve their instructional decisions continuously.

Furthermore, providing structured professional development and mentoring programs is highly recommended to support teachers' ongoing growth. Coaching and peer assistance from high-performing teachers can help improve consistency in teaching performance and ensure that all educators achieve a high standard of practice. Considering that only certain 21st-century skills showed a significant relationship with teaching performance, it is also recommended that the existing performance evaluation system be reviewed and enhanced better to capture innovative, collaborative, and technology-driven teaching practices. This will ensure that teachers' modern instructional competencies are accurately recognized and rewarded. Finally, the proposed action plan plays a crucial role in bridging the gap between 21st-century teaching practices and performance evaluation. Its full implementation, supported by sufficient resources and strong administrative backing, can significantly enhance teachers' competencies in key areas such as creativity, collaboration, and information, media, and technology literacy. Continuous monitoring and regular evaluation are also necessary to assess progress, ensure effectiveness, and sustain long-term improvements in teaching performance and student learning outcomes.

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Personalized marketing, online customer experience, and consumer retention in e-Commerce businesses: Basis for customer engagement plan

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Abstract

This study investigated the relationships among personalized marketing, online customer experience, and consumer retention in e-commerce businesses in Shaanxi Province, China. Employing a descriptive correlational research design, the study targeted 384 e-commerce consumers as respondents, given their direct engagement with personalized marketing campaigns and online customer services. The research aimed to assess the effectiveness of personalized marketing strategies, evaluate consumers' online experience, and determine factors influencing customer retention. Results revealed that personalized marketing strategies—including customer data utilization, customized content and communication, and customer engagement and interaction—were generally perceived as effective, with weighted means ranging from 2.95 to 2.97. Online customer experience, measured across website or app usability and design, interactivity and personalization, and trust and security, yielded a composite mean of 2.96, indicating that consumers agreed that these dimensions positively contribute to their online experiences. Consumer retention was also positively evaluated, with service quality and post-purchase experience, personalized retention strategies, and consumer loyalty and satisfaction recording composite means between 2.97 and 2.99, suggesting that these factors likely influence repeat purchases and loyalty. Correlation analyses, however, indicated that most dimensions of personalized marketing did not significantly relate to online customer experience metrics. Specifically, customer data utilization and customized content and communication showed no significant correlations with usability, interactivity, or trust and security. Customer engagement and interaction demonstrated a significant negative relationship only with interactivity and personalization ($\rho = -0.138$, $p = 0.007$), suggesting that excessive engagement efforts may diminish the perceived quality of personalization. These findings imply that while personalized marketing strategies are effective in practice, their influence on overall online customer experience may be limited unless aligned with user-friendly design, meaningful interactivity, and trust-enhancing features. The study provides a plan for integrating personalized marketing with optimized digital experiences to strengthen customer retention in e-commerce settings.

Keywords: customer engagement, customer experience, consumer retention, e-commerce, online, personalized marketing, user experience

Personalized marketing, online customer experience, and consumer retention in e-Commerce businesses: Basis for customer engagement plan

1. Introduction

In today's fast-changing digital marketplace, consumer experience and digital marketing are increasingly becoming important tools in helping establish lasting connections with consumers. Businesses realize that more consumers shop through the internet, and thus must utilize data-driven approaches to develop customized marketing campaigns and experiences. Data-driven marketing approaches help improve the experience and loyalty of consumers in the increasingly competitive business environment. In this case, businesses seeking to succeed in the digital era need a good grasp of consumer behavior. Narrowing down this broad focus, personalized marketing has emerged as a key development within digital marketing strategies. By personalizing the content, products, and ways of communicating based on detailed information regarding every individual client, including his or her preferences and shopping behavior, firms can enhance their clients' virtual experiences. The emphasis on personalization as part of the marketing strategy is very much linked to the enhancement of the clients' virtual experience through effective website usability and interaction.

Nevertheless, even though the effects of personalized marketing and the experience of customers when they go online have received extensive coverage in different settings, there is still limited evidence that addresses these effects with regards to customer loyalty in regional settings, such as the province of Shaanxi. This gap arises since literature tends to ignore unique features of particular regions. Moreover, while it has been established that personalization enhances consumer engagement and satisfaction, few studies delve into how these aspects translate into sustained customer loyalty, particularly in regional Chinese markets like Shaanxi. The existing models are unable to integrate customer satisfaction, loyalty, and adaptation of digital marketing strategies tailored to the unique e-commerce landscape in China.

The research aimed at filling these critical gaps through investigating the influence of customer experience and personalized marketing on consumer loyalty within the online retail sector in Shaanxi province. The study concentrated on the following goals among others such as determining the way through which personalized marketing affects customer satisfaction and repeat purchase behavior within the regional e-commerce market. Secondly, evaluated the effect of customer experience online on customer loyalty, including factors such as website performance, customer care, and online interaction. Finally, the study also explored the effect of the integration between personalized marketing and online customer experiences that lead to retaining customers in the region. This research aimed at offering some key findings regarding how regional e-commerce firms can develop sustainable relations with their customers. Apart from that, these findings were useful to local policy makers as well as businesses that wanted to achieve digital transformation and economic development in the province of Shaanxi.

Objectives of the Study - This study aimed to disclose the actual performance and examined the relationships among personalized marketing, online customer experience, and consumer retention in E-commerce in Shaanxi province, China. Specifically, it described personalized marketing in terms of customer data utilization, customized content and communication, and customer engagement and interaction; assessed the level of online customer experience concerning website or apps usability and design, interactivity and personalization, and trust and security; determined the degree of consumer retention in terms of loyalty and satisfaction, consumer engagement initiative, and service quality and post-purchase experience; tested the relationships among personalized marketing, online customer experience, and consumer retention; and proposed customer engagement plan for enhancing consumer retention in e-commerce businesses through personalized marketing and online customer experience in Shaanxi Province, China.

2. Method

Research Design - This study employed descriptive correlational research. Descriptive correlational research is a research design that attempts to describe associations between two or more variables without manipulating them. It tries to establish the extent and direction of associations between variables but does not establish causality (Creswell et. al.,2018). This research method is widely used in the field of social sciences, business studies, and economics, as well as education. There arises a need for studying trends and relationship among the variables in practical situations. This is achieved using various techniques like Pearson's Correlation that help understand the degree and significance of these relationships. The use of descriptive correlational research in this study is quite appropriate since it involve describing and analyzing the relationship between personalized marketing, online customer experience, and consumer retention for e-commerce firms operating within Shaanxi province. Considering that the research survey observed and not manipulated variables in the e-commerce industry, descriptive correlational research gave the researcher the chance to systematically analyze trends and activities that correlate in the e-commerce sector.

The descriptive correlational design was adopted in this research in to investigate the systematic relationships among personalized marketing, online customer experience, and consumer retention within the context of e-commerce businesses in the Shaanxi Province. In the descriptive section, the respondents were analyzed in terms of their sex, age, educational attainment, and monthly income. All this information was provided through various descriptive statistics like mean, standard deviation, and frequency distribution. Correlation analysis was done via Pearson's Correlation to test the level of relationship existing between online customer experience and customized marketing and customer retention. The study provided practical data on the issue of customer experience as well as the effect of modern marketing techniques on consumer loyalty and retention. A suggestion was given for the improvement of online marketing strategy and customer relations plan.

Research Locale - Shaanxi Province was selected for examination because it possessed a rapidly emerging e-commerce market and a favorable position between China's top economic hubs. The province had been experiencing magnificent digitalization with increasing internet penetration and more internet users. Also, Shaanxi's market saturation with current and potential new e-commerce companies provided a perfect spot to study the effects of web customer experience and targeted marketing on loyalty. The government in Shaanxi was encouraging digital economy companies. As a result, it provided a good location to study how companies use targeted marketing to attract and retain customers as far as possible. Carrying out the research in Shaanxi provided regional analysis relevant to other similar emerging e-commerce marketplaces in China.

Respondents of the Study - The sample population used was consumers of e-commerce within the Shaanxi Province because they were the stakeholders who would directly experience the personalized marketing initiatives and the customer experience online. The success of the marketing strategies was dependent on the views and purchasing trends of the target market. To determine if custom marketing and customer experience in the Internet environment influence loyalty, satisfaction, and website usage, real data from consumers was used. The research was done among consumers from Shaanxi to ensure that the results would enable adjustment of marketing strategies.

Until now, no clear data regarding the exact number of online consumers in Shaanxi Province can be easily accessed. Nonetheless, the province's e-commerce market has rapidly developed in recent years. For instance, the capital city of Shaanxi, Xi'an, that has about 12 million people in its population, has had significant changes with respect to the increasing demand for foreign food products, and therefore there will be an increase in e-commerce activity. In three years, the number of foreign fruits imported to Shaanxi has multiplied by three, from 40,000 tons to 130,000 tons, meaning that there is an increase in e-commerce (USDA Foreign Agricultural Service, 2020). In addition, per capita disposable income of urban households in Shaanxi is RMB 40,713, meaning that there is rising purchasing power, which probably contributes to increased online spending (HKTDC Research, 2022). Although such evidence shows increased online consumers, it may be difficult to come up with the exact figures without

getting further data or research from consumer behavior studies.

Since the overall number of consumers online in Shaanxi Province is unknown, the best method for calculating the sample size was Cochran's sample size estimation formula. This method is widely used when the population is unknown or too large. It used a margin of error, confidence level, and an estimate of the target population proportion. Using the equation, the sample size obtained was 384. A total of 384 respondents were chosen among the branches of e-commerce companies in Shaanxi Province, China. A total of 96 respondents (25.00%) were taken from Branch A, 96 respondents (25.00%) from Branch B, 96 respondents (25.00%) from Branch C, and 96 respondents (25.00%) from Branch D. This ensured that equal representation was made among the consumers in each of the selected branches. Purposive sampling technique was used in choosing the participants of the study. This helped locate individuals who were directly participating in online shopping to get information from individuals who were interested in the topic.

Purposive sampling was applied to recruit the respondents. It helped identify respondents actively involved in online purchases so that the study could gain insights from concerned respondents. The survey captured active online respondents in Shaanxi Province and frequent buyers through e-commerce websites, and screen questions to ensure respondents fulfill the inclusion requirements, e.g., have placed an online purchase at least once in the last three months. This study included participants who were active online shoppers from Shaanxi Province and had a background in purchasing online. The participants were; (1) 18 years old or older, (2) had made online purchases at least three times, and (3) from Shaanxi Province. It ensured that the inclusion of participants had relevant background in e-commerce. Furthermore, their response provided information regarding personalized marketing, online customer experience, and consumer retention. Exclusion criteria included respondents who were not within Shaanxi Province, failed to purchase products online for at least three times, and those who worked for e-commerce companies directly within marketing, customer service, or management departments, so as not to introduce response biases. The requirements maintained the research on general Internet consumers, not subject matter experts with prior experience or business perceptions.

Data Gathering Instrument - The following instruments were used: Respondents Profile Questionnaire. This was designed to pick up core demographic information, including sex, age, highest level of education, and monthly income. These indicators formed a simple profile of the respondents and facilitated useful analysis of the impact of demographic factors on attitudes toward customized marketing, internet customer experience, and customer retention in e-commerce.

Personalized Marketing Questionnaire. The researcher developed an investigation tool to assess the effectiveness of tailored marketing strategies in e-commerce businesses in Shaanxi Province. It consisted of three basic dimensions: Customer Data Utilization, Personalized Content and Communication, and Customer Engagement and Interaction. Each dimension had five statements that will be rated by the respondents on a four-point Likert scale (4 – Very Effective, 3 – Effective, 2 – Ineffective, 1 – Very Ineffective). This survey aimed to determine how companies use customer data, send personal content, and activate consumers to improve retention. The questions were crafted following supporting literature and online business practices so that they may be meaningful and relevant. The tool went through face validation using online marketing and electronic commerce experts to secure validity. This further underwent pilot testing on reliability via Cronbach's Alpha to ensure internal consistency before implementing full-scale data gathering.

Customer Online Experience Questionnaire. This self-developed measurement tool measured consumers' experience with online shopping websites. It measures three important dimensions: Usability and Design of Websites or Apps, Interactivity and Personalization, and Trust and Safety. The measurement tool applied the four-point Likert scale ranging from 4–Strongly Agree, 3–Agree, 2–Disagree, 1–Strongly Disagree to measure customer satisfaction levels in the respective categories. Website/Apps Usability & Design considered the usability of the website, the quality of web pages, speed of loading pages, and mobile compatibility. Interactive and Personalized criterion evaluated the extent to which the website was personalized for the consumer, as well as the interaction of

the website with the consumers through interactive media. The Interactivity and Personalization criterion measured the level of personalization of the website for consumers as well as its interactivity with consumers using interactive media. The Trust and Security criterion measured the level of trust that can be placed in the website in protecting consumer information, conducting secure transactions, and disclosing policies. The experts conducted a pilot test to check the relevance and accuracy of the tool's content.

Customer Retention Questionnaire. The Customer Retention Questionnaire is an instrument created by a researcher to measure the consumer retention ability of online businesses. The survey considers the following three critical factors: Consumer Satisfaction and Loyalty, Personalized Retention Program, and Service Quality and Post-Purchase. It measures using a four-point Likert scale (4-Very Likely, 3-Likely, 2-Unlikely, 1-Very Unlikely). This is done to gauge whether consumers are likely to be loyal to the e-commerce business from their perspective. The Consumer Loyalty and Satisfaction factor examines repeat purchase, brand preference, and overall customer satisfaction. The Personalized Retention Strategies segment evaluates the success of personalized promotions, loyalty programs, and personalized offers in enhancing retention. The After-Sales Service and Quality factor evaluates after-sales service, the refund policy, and the responsiveness to customer queries. For the validation and reliability of the measurement tool, two stages were implemented, namely the expert review stage and pilot testing stage.

Validity of the Questionnaire. Face validation by three experts in e-commerce, marketing, and consumer behavior was carried out to validate the questionnaire. These experts scrutinized the questionnaire for its clarity, pertinence, and completeness to measure personalized marketing, online customer experience, and consumer retention. These comments were utilized to establish clarity in ambiguous questions, ensure consistency with the objectives of the research study, and establish that the questions reflect the concepts under study. Any modifications necessary for the same were incorporated according to their advice to guarantee validity in the questionnaire.

Reliability of the Questionnaire. For determining the reliability of the questionnaire, a pilot test was conducted on 30 randomly selected online consumers who were not involved in the research. Responses from the pilot test were analyzed using Cronbach's Alpha Coefficient, which determined the consistency of questions within the questionnaire. A value of Cronbach's Alpha greater than or equal to 0.70 was considered reliable (Nunnally et al.,1994). Below 0.70 value of Cronbach's Alpha necessitated changes or modifications to be made in the questionnaire. These changes may include elimination of unreliable questions, changing ambiguous questions into clear and unambiguous forms, or restructuring the scales. All the sub-variables yielded Cronbach alpha coefficients ranging from 0.80 to 0.90.

Internal consistency across variables was very high in the instrument. In Personalized Marketing, very high internal consistency was obtained from Customer Data Utilization ($\alpha = 0.941$) and Customer Engagement and Interaction ($\alpha = 0.933$), whereas high internal consistency was obtained from Personalized Content and Communication ($\alpha = 0.836$), indicating generally high internal consistency ($\alpha = 0.819$). High internal consistency was also obtained from Online Customer Experience, where Interactivity and Personalization ($\alpha = 0.927$) and Trust and Security ($\alpha = 0.921$) were very high, and Website or Apps Usability and Design ($\alpha = 0.842$) was high ($\alpha = 0.827$). On the other hand, high internal consistency was consistently obtained from Customer Retention, specifically in Consumer Loyalty and Satisfaction ($\alpha = 0.912$).

Table 1
Reliability Results

Variables	No. of Items	α value	Interpretation
Personalized Marketing			
Customer Data Utilization	5	0.941	Excellent
Personalized Content and Communication	5	0.836	Good
Customer Engagement and Interaction	5	0.933	Excellent
Overall	15	0.819	Good

Online Customer Experience			
Website or Apps Usability and Design	5	0.842	Good
Interactivity and Personalization	5	0.927	Excellent
Trust and Security	5	0.921	Excellent
Overall	15	0.827	Good
Customer Retention			
Consumer Loyalty and Satisfaction	5	0.912	Excellent
Personalized Retention Strategies	5	0.848	Good
Service Quality and Post-Purchase Experience	5	0.804	Good
Overall	15	0.891	Good

Legend > 0.9 =Excellent; >0.8=Good;>0.7=Acceptable;>0.6=Questionable;>0.5=Poor;<0.5=Unacceptable

Data Gathering Procedure - Prior to the distribution of the questionnaire, a pilot phase was conducted to guarantee that the process of data gathering would be efficient. In the first place, the screening questions were developed to filter respondents based on the inclusion and exclusion criteria. In the second place, the questionnaire was validated through expert review. A pilot survey of the survey instrument was conducted on a smaller subset of the respondents to pre-test the instrument and determine if ambiguities or questionnaire wording issues occurred. As the study entailed cooperation with online shops, written permission from these businesses were requested to determine their consent to distribute the questionnaire among their customers. Additionally, all information collected were anonymized and stored safely to ensure respondents' confidentiality and prevent unauthorized access. No personal data were gathered unless specifically necessary. The questionnaire was spread through online survey sites, such as social media (WeChat, Weibo), e-commerce forums, and consumer groups, and collaboration with e-commerce companies which helped target verified consumers. QR codes linked to the survey and email invitations was utilized for broader dissemination. To ensure representativeness, the sample was taken from all age brackets, income levels, and educational levels, and the monitoring system ensured that the sample distribution is in accordance with demographic quotas. Data collection involved monitoring responses for completeness and consistency, removing duplicated or incomplete entries to ensure data quality.

Data Analysis - In this study, the impact of customized marketing, website customer experience, and customer retention in Shaanxi Province online commerce firms has been scientifically assessed using the SPSS 2.0 software program. Statistical Package for the Social Sciences (SPSS) is a standard statistical package offering numerous functions related to data handling, descriptive statistics, comparative statistics, and correlations. It was utilized for data analysis. Frequency and percentage distribution were used to analyze respondents' demographic profile. On the other hand, Mean and Standard Deviation were used to analyzed personalized marketing, online customer experience and customer engagement. Correlation analysis was performed using Pearson's correlation coefficient to evaluate the interrelation among personalized marketing, customer experience in online environments, and consumer retention. A connection and strength between these two variables have already been proven by this analysis mentioned above; therefore, information can be gained regarding whether the trend toward personalizing marketing and customers' experiences will have any significant influence on consumers' loyalty and retention. On the contrary, the lack of connection would mean that some other variables are more influential in customer retention.

Ethical Considerations - Maximization of ethical considerations is necessary during the research process to ensure study credibility and integrity. In this regard, the researcher ensured that what he was doing fell under the set of ethical principles and guidelines to ensure participants' rights and well-being were respected while maintaining the trust and confidentiality of the data. The study's objectives, methodology, and any associated risks were also reported to each subject for possible participation in the research. Copies of informed consent were handed out, clearly stating the nature of the study: an entirely voluntary undertaking that allowed the subject full discretion to withdraw from the study without any implications or penalties.

Before data was collected, confidentiality and privacy were assured to be of the utmost value. Respondents' identifiable information and any other identifiable data collected from the respondents were not published and

were, therefore used only for this study. Data storage and access were strictly maintained securely, with the understanding that no one would ever disclose any sensitive information; otherwise, they would misuse it. The participants were informed of the research goals, procedures, and results they would gain through the study. This removed any ambiguity or uncertainty regarding the procedure to be adopted for the research, which made the participants clearly understand the purpose of the study and its importance.

The researcher gave full credit to all used references and sources by following the APA style guidelines regarding citations of other researchers' works. Therefore, this indicated that previous research contributed to the development of the present study. The researcher adopted all the responsibilities, considering that the participants in the research were not affected in any way. The study was properly planned and executed, considering any risks the participants might face during the research. Proper consideration was given to minimize adverse effects and uphold the welfare of the participants while pursuing ethical practices and protocols.

3. Results and discussion

Table 2
Summary Table of Personalized Marketing

Indicators	Weighted Mean	Verbal Interpretation	Rank
Customer Data Utilization	2.97	Effective	1
Customized Content and Communication	2.95	Effective	3
Customer Engagement and Interaction	2.96	Effective	2
Composite Mean	2.96	Effective	

Legend: 3.50-4.00=Very Effective; 2.50-3.49=Effective; 1.50-2.49=Ineffective; 1.00-1.49=Very Ineffective

Table 2 summarizes the consumers responses on personalized marketing. Overall, it can be denoted that it is considered effective in the e-commerce platforms in the province of Shaanxi based on the composite mean of 2.96. This shows that people generally consider personalized marketing in e-commerce platforms in Shaanxi as a very effective approach to engage customers. The average combined score of 2.96 points to a positive overall effect on customer engagement and satisfaction. The finding that in, person marketing is indeed a very effective promotional tool in e-commerce platforms in Shaanxi (composite mean 2.96) goes hand in hand with Li (2020) who points out that digital technologies and mobile marketing create more communication and engagement opportunities. Therefore, the use of digital platforms allows companies to execute personalization strategies efficiently, which, in turn, increases.

Of the three dimensions of personalized marketing, *Customer Data Utilization* generated the highest weighted mean (2.97, effective). Customer data usage is regarded as the most potent element of personalized marketing out of the three components. This means that marketing based on customer information is at the very heart of both marketing that is effective and marketing that is compelling. The result that Customer Data Utilization was assigned the highest weighted average (2.97) aligns with the insights by Chandra et al. (2022), who point out that the optimal use of data is at the core of successful personalized marketing. The use of customer data allows companies to limit the options their customers have to face and to provide a personalized experience that, in turn, elevates stakeholders' engagement and loyalty through customer, data, driven, multichannel personalization strategies. Customer Engagement and Interaction recorded a weighted mean of 2.96 (effective). This simply implies that personal marketing is basically a really strong tool that can boost customer engagement and interaction to almost double the figures. Agreeing in general with the fact that consumers are very enthusiastic about the brand strategies to encourage them actively involved with the brand as a result of the weighted average of 2.96. By aligning marketing with the individual interest at the time, a business can increase engagement, satisfaction, and loyalty which is consistent with the customer interactions positive impact.

Though ranked third, *Customized Content and Communication* remain close with the other dimensions with a weighted mean of 2.95 (effective). It can be inferred that, even though the customized content and communication dimension ranks third in the perceptions of effectiveness, the customers consider it as a convincing method of influence. The standardized average value of 2.95 reflects that it is equally effective as the other dimensions in

facilitating personalized marketing. Customized Content and Communication ranking third with a weighted mean of 2.95 is consistent with Wang et al. (2024), who state that tailored content is like digital "self, marketing" that bridges the gap between the organization's capabilities and the results they want. On the other hand, making personalized communications is a way for businesses to react appropriately to customer behavior, thus supporting engagement and retention in the same way that self, marketing can lead to individual success.

Table 3*Summary Table of Online Customer Experience*

Indicators	Weighted Mean	Verbal Interpretation	Rank
Website or Apps Usability and Design	2.96	Agree	2
Interactivity and Personalization	2.96	Agree	2
Trust and Security	2.96	Agree	2
Composite Mean	2.96	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-3.49=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

The summary of online customer experience is demonstrated in Table 3. The overall composite mean shows 2.96 (agree). This signifies that, on the whole, customers tend to agree that their online experience is good. The composite mean of 2.96 suggests that features such as usability, personalization, trust, and engagement are considered as the main factors that add value to the customer experience. The positive feeling of the customers towards the online experience of the company (composite mean 2.96) is in line with Jabbar et al. (2019), who indicate that being responsive to customer needs in real, time increases customer satisfaction. Brief and personable contacts are a kind of signal that the organization is concerned and thus the relationship gets strengthened and customer loyalty gets fostered. Customers, indeed, have had a mostly positive experience reported online.

As can be seen in the table, Website or Apps Usability and Design, Interactivity and Personalization, and Trust and Security revealed the same composite mean of 2.96 (agree). This means that consumers consider Website or App Usability and Design, Interactivity and Personalization, and Trust and Security as equally potent factors. The same composite mean of 2.96 shows that these three aspects are all necessary and together they make a positive online customer experience. The three factors Website or Apps Usability and Design, Interactivity and Personalization, and Trust and Security have the same composite mean of 2.96 which is in line with the findings of Lemon et. al. (2019), who argue that user, friendly design, the ability to respond quickly, and personalized content improve user experience. Therefore, these essential elements are seen to be responsible for customer satisfaction, a higher level of engagement, and continued loyalty to digital platforms.

The summary of consumer retention is depicted in Table 4. Overall, the composite is 2.99 (Likely). This means that customers generally show a high likelihood of sticking to the platform or store. The overall retention figure derived from the average of 2.99 points to a generally positive scenario, thus, it can be concluded that the strategies employed in regular engagement and continuous patronage have been quite effective. The customer retention which is positive and has been reflected in the composite mean of 2.99 is in conformity with Zhou et al. (2020), who demonstrated that a personalization approach based on clustering leads to improved recommendation relevance and better user experience. Such personalization strategies that provide more customized and significant suggestions not only increase engagement but also encourage the customers to purchase again, thereby, supporting customer loyalty as a whole.

Table 4*Summary Table of Consumer Retention*

Indicators	Weighted Mean	Verbal Interpretation	Rank
Consumer Loyalty and Satisfaction	2.97	Likely	3
Personalized Retention Strategies	2.98	Likely	2
Service Quality and Post-Purchase Experience	2.99	Likely	1
Composite Mean	2.98	Likely	

Legend: 3.50-4.00=Very Likely; 2.50-3.49=Likely; 1.50-2.49=Unlikely; 1.00-1.49=Very Unlikely

Among the three dimensions of customer retention, Service Quality and Post-Purchase Experience recorded the highest composite mean of 2.99 (Likely). This infers that out of the different elements of customer retention, service quality and post, purchase experience are the most effective in convincing customers to remain loyal. The

composite mean of 2.99 at the highest-level shows that a positive service encounter and dependable follow-up are the major factors that lead to repeat engagement and satisfaction. The focus on personalized digital services and strategic engagement found by Li et. al.(2022) matches the result that service quality and post-purchase experience obtained the highest customer retention scores (mean 2.99). In the same way, libraries can increase user satisfaction through services that are tailored and responsive, e-commerce platforms can retain their customers most efficiently by offering high-quality service and dependable post-purchase support.

Personalized Retention Strategies generated a composite mean of 2.98 (Likely) and ranked second. This means that tailored retention strategies are very effective in convincing customers to continue being loyal to the platform or store. This clearly illustrates that changing the offers, communication, or incentives in line with the customer's profile highly impacts the recommencement of repeat purchases. This aligns with Lemon et. al.,(2019) who argue that highly personalized offers and finely calibrated digital interactions enhance user experience and satisfaction. Through personalization of retention activities, companies deepen the involvement and loyalty of customers, which is the basis of the relationship that lasts with them.

Consumer Loyalty and Satisfaction recorded a composite mean of 2.97 (Likely) ranked third and the lowest among the dimensions of customer retention. This suggests that even if consumer loyalty and satisfaction show positive signs, they are the least influential factors among the customer retention dimensions. The overall average of 2.97 points to that customers will generally remain loyal and satisfied, however, factors such as the quality of service and customer retention personalized strategies have a greater impact on customer retention. This is consistent with Chandra et al. (2022) who stress that through personalized marketing customer engagement and emotional bonds that make loyalty possible are created. Customer loyalty is the least important among the retention factors, but at the same time, targeted, personalized interactions still have an impact on raising customer satisfaction and getting repeat business.

Table 5 presents the relationship between personalized marketing dimensions and online customer experience. Overall, the results indicate that most dimensions of personalized marketing did not show statistically significant relationships with website or app usability and design, interactivity and personalization, and trust and security, suggesting that personalization efforts alone may not uniformly translate into enhanced online customer experience outcomes.

Table 5
Relationship between Personalized Marketing and Online Customer Experience

Variables	rho	p-value	Interpretation
Customer Data Utilization			
Website or Apps Usability and Design	0.033	0.524	Not Significant
Interactivity and Personalization	0.092	0.073	Not Significant
Trust and Security	-0.028	0.585	Not Significant
Customized Content and Communication			
Website or Apps Usability and Design	0.017	0.743	Not Significant
Interactivity and Personalization	-0.010	0.840	Not Significant
Trust and Security	0.025	0.623	Not Significant
Customer Engagement and Interaction			
Website or Apps Usability and Design	-0.085	0.095	Not Significant
Interactivity and Personalization	-.138**	0.007	Significant
Trust and Security	-0.032	0.528	Not Significant

***. Correlation is significant at the 0.01 level*

Specifically, customer data utilization was not significantly related to any dimension of online customer experience. The weak and non-significant correlations imply that the mere use of customer data does not necessarily improve users' perceptions of usability, interactive features, or trust and security. This suggests that customers may be less sensitive to backend data practices unless these are clearly manifested in tangible and meaningful online experiences. The fact that there is only a slight impact of using customer data on the online customer experience can be explained by the fact that customers only care about the data practices of the companies at the backend if those lead to clear and tangible improvements in usability, interactivity or trust. Thus, Ahmad et

al. 's (2022) findings that certain personalization efforts may not significantly increase the perceived online experience if they are not directly and tangibly manifested in the customer, visible service items or benefits (e. g., personalization features may have a small impact on satisfaction and related outcomes) are in line with this.

Similarly, customized content and communication hardly showed any significant correlation with usability and design, interactivity and personalization, or trust and security. These results suggest that although content customization is typical in digital marketing, it might not be enough to influence customers' overall experience even if it is perceived as relevant, timely, and value, adding. The lack of clear linkages between personalization of content and the main experience dimensions is consistent with the results of studies which showed that personalization by itself does not necessarily result in better customer behaviour or perceptions unless it is a radical part of the whole experience. Similarly, studies have shown that personalized messages or email content, even if simple, do not always lead to stronger behavioural responses or to a better user experience if they are irrelevant and not delivered in a context, and mood, sensitive way, thus demonstrating the need for personalization to be more than just a superficial modification (Nobile et. al.,2023).

In contrast, customer engagement and interaction had a significant negative relationship with interactivity and personalization (0. 138, $p=0.007$). This indicates that as engagement and interaction levels increase, the degree of interactivity and personalization assessment decreases. A reasonable hypothesis would be that overuse of engagement elements like the very frequent appearance of prompts, pop, ups, or requests for interaction could result in user frustration and they may feel that the personalization is less of a quality factor and more of a signal that they have been 'overdoing' it. What the discovery reveals is that there is a need for the right dosage in engagement techniques insofar as it is stressed that personalization should not just emphasize but also keep the user experience from becoming overloaded. The negative correlation between customer engagement and perceived interactivity, which was in line with the findings from the research, is that personalization may cross the boundary where, instead of being perceived as a help to the customer, it becomes an intrusion. Personalization intrusiveness literature, based studies have identified that the users generally feel the personalized messages or interactive suggestions as being pushed too drastically and aggressively as a result of which they behave in a way that they basically withdraw their engagement intentions and at the same time the quality of the online experiences gets down (Lee et al., 2022).

Overall, the results indicate that personalized marketing is not a guarantee for positive online customer experiences. It is only through the manner in which engagement and interactive elements are planned and carried out that personalization can be successful. User, focused and thoughtful personalization strategies that emphasize relevance and ease may be a better way of enhancing online customer experience than extensive or mass personalization initiatives.

Table 6
Relationship between Personalized Marketing and Customer Retention

Variables	rho	p-value	Interpretation
Customer Data Utilization			
Consumer Loyalty and Satisfaction	0.031	0.550	Not Significant
Personalized Retention Strategies	0.100	0.051	Not Significant
Service Quality and Post-Purchase Experience	-0.071	0.165	Not Significant
Customized Content and Communication			
Consumer Loyalty and Satisfaction	-0.039	0.450	Not Significant
Personalized Retention Strategies	0.040	0.429	Not Significant
Service Quality and Post-Purchase Experience	0.069	0.175	Not Significant
Customer Engagement and Interaction			
Consumer Loyalty and Satisfaction	0.046	0.369	Not Significant
Personalized Retention Strategies	0.054	0.292	Not Significant
Service Quality and Post-Purchase Experience	0.057	0.263	Not Significant

**. Correlation is significant at the 0.01 level

Table 6 presents the relationship between personalized marketing and customer retention. The findings indicate that none of the dimensions of personalized marketing exhibited a statistically significant relationship

with any of the customer retention indicators, namely consumer loyalty and satisfaction, personalized retention strategies, and service quality and post-purchase experience.

In particular, using customer data to a great extent shows very weak, almost, no correlations that are significant with all aspects of customer retention. What is meant here is that merely gathering and using customer data does not on its own lead to loyal customers, better customer retention strategies, or enhanced post, purchase experiences. Consumers will not readily value data, driven initiatives unless they are clearly reflected in major service improvements. This result is supported by the findings of Gosling et. al.,(2023) who stressed that any personalization efforts should primarily bring real value to customers if they are intended to influence consumer loyalty or perceptions merely. Studies on the effectiveness of personalization revealed that personalization alone is not sufficient to enhance the impact of a message or an experience unless it is in line with the customers' immediate needs and situations. Hence, different outcomes from a contextual study of personalization effects during various shopping stages indicate that data misuse without visible benefits may fail to increase loyalty or retention.

Also, tailored content and communication do not have a major impact on consumer loyalty and satisfaction, personalized retention strategies, or service quality and post, purchase experience. The finding suggests that even though personalized marketing messages and content are a common practice, they may not be enough to impact long, term retention if they do not correspond to the customers real needs and expectations. The finding that individualized content and communication did not significantly affect customer loyalty, retention strategies, or service quality aligns with Vishwakarma's (2025) study, which revealed that personalization effects mainly depend on how relevant and well, executed it is rather than the mere fact of implementation. The research on personalization outcomes was the last case that demonstrated that without value delivery and customer needs (such as trust and transparency) fulfillment, personalized initiatives are unlikely to generate higher loyalty or experience (hence, the customer loyalty and experience outcome are not significantly influenced by personalization alone at the long term unless it satisfies users as in the personalization effects research that points to the role of customer relevance and perception).

Besides that, customer engagement and interaction appeared not to show any significant relationship with any of the customer retention dimensions. It means that engagement efforts, if they are not supported by other factors, might not be strong predictors of customer loyalty or repeat purchases. It brings to light that customers may, in fact, put consistent service quality, reliability, and value as their top priorities over interactive or engagement, focused marketing initiatives when making a decision to be loyal. This is supported by the most recent research which proves that engagement alone cannot be the reason for customer retention over time. Studies have revealed that while interactive features can certainly help in making the user experience more enjoyable, customers, ultimately, are more concerned with consistent service quality, reliability, and the real benefits that they get rather than just engagement. Consequently, the strongest customer retention policies are those that incorporate customer engagement with major service improvement and value creation at the same time (Vishwakarma, 2025).

In general, the results indicate that personalized marketing at this place doesn't really have a direct or strong impact on customer retention. Actually, it reveals that the companies shouldn't solely rely on personalization strategies but also should implement overall strategies which combine personalization with great, high, quality service, quick post, purchase support, and customer relationships based on value as a way of ensuring customer retention for a long period.

Table 7
Proposed Personalized Marketing and Online Customer Engagement Plan

Key Results Area	Objectives	Strategies	Person/s Involved	Success Indicator
Personalized Marketing (Customized Content and Communication)	To enhance customer engagement and satisfaction by delivering	1. Behavior-Based Content Personalization Utilize customer browsing history, purchase patterns, and interaction data to deliver relevant product	Marketing Manager / Digital Marketing Team Data Analyst/CRM	20% increase in click-through rate (CTR) for personalized messages compared to non-personalized

	marketing content and communications that are tailored to individual preferences, behaviors, and needs.	recommendations, promotions, and messages in real time. 2. Segmented and Timely Communication Group customers based on preferences, frequency of purchase, and engagement level, then send targeted emails, app notifications, or SMS messages at optimal times to avoid message fatigue. 3. Feedback-Driven Content Refinement Continuously collect customer feedback and engagement metrics (click-through rates, dwell time, conversions) to refine and adjust personalized content, ensuring it remains relevant, value-adding, and non-intrusive.	Specialist IT/Platform Support Team	content 15% improvement in customer engagement 10% increase in repeat purchase rate
Online Customer Experience: Website or Apps Usability, Interactivity and Personalization, Trust and Security	To enhance online customer experience by ensuring a user-friendly website or app, delivering balanced and meaningful interactivity and personalization, and maintaining high standards of trust and security to improve customer satisfaction, confidence, and continued platform use.	1. Optimize platform usability and performance by improving interface design, navigation clarity, loading speed, and mobile responsiveness to ensure a seamless user journey. 2. Implement smart, non-intrusive personalization features such as relevant product recommendations 3. Strengthen trust and security mechanisms through secure payment systems, transparent data privacy policies, and visible security assurances to reinforce customer confidence.	IT and Web Development Team Digital Marketing and UX/UI Designers Customer Service and Data Protection Office	Website/App usability satisfaction score increases to 85% based on user feedback surveys. Customer engagement and personalization effectiveness (e.g., interaction rates, click-through on personalized features) reaches 80%. Trust and security confidence level (perceived data protection and secure transactions) improves to 90% among users.
Consumer Retention: Consumer Loyalty and Satisfaction	To strengthen consumer loyalty and satisfaction by consistently delivering positive, reliable, and personalized online experiences that encourage repeat purchases and long-term engagement with the platform	1. Implement personalized loyalty programs and targeted rewards based on customers' purchase history and preferences to reinforce repeat buying behavior. 2. Enhance post-purchase support (e.g., responsive customer service, order tracking, and hassle-free returns) to sustain satisfaction beyond the point of sale. 3. Continuously gather and act on customer feedback through reviews and surveys to refine services and address pain points before they affect loyalty.	Customer Relationship Management (CRM) Team Customer Service Representatives Marketing and Data Analytics Team	Repeat purchase rate reaches 85% among active customers. Customer satisfaction score improves to 90% based on post-purchase surveys. Customer retention rate increases to 80% over a 12-month period.

4. Conclusions and recommendations

Customer data utilization, customized content and communication and customer engagement and interaction as strategies for personalized marketing in Shaanxi Province were found to be effective in e-commerce businesses. E-commerce businesses' consumers in Shaanxi Province agreed that they have positive online experience on website or apps usability and design, interactivity and personalization, trust and security. Consumers in e-commerce business in Shaanxi Province were likely to retain in the digital platforms because of consumer loyalty and satisfaction, personalized retention strategies and service quality and post-purchase experience. Most dimensions of personalized marketing did not show statistically significant relationships with website or app usability and design, interactivity and personalization, and trust and security. In addition, personalized marketing strategies did not show statistically significant impact on customer retention. Personalized marketing and online customer experience plan for e-commerce businesses in Shaanxi Province was proposed for implementation.

E-commerce businesses in Shaanxi Province may keep on using customer data, tailored content, and engagement strategies for personalization. E-commerce businesses may continue to maintain and improve the usability of the website/app, the interactive functionalities, and the security measures to provide positive online

experiences. E-commerce businesses are advised to keep up with the personalized retention methods they have implemented while also managing to provide excellent service and post-purchase care to obtain consumer loyalty. E-commerce businesses may bring together a personalized marketing strategy with the enhancements of usability, interactivity, and security to deliver an overall online customer experience to the full. Future researchers may consider investigating the different ways that ply together personalization strategies that are of one kind or another differently with specific elements such as usability, interactivity, and trust of the online customer experience to have an insight into which combinations are most effective in raising engagement and retention. Businesses are advised to carry out the Proposed Personalized Marketing and Online Customer Experience Plan through the combination of customer data usage, personalized content, and engagement approaches, along with excellent website/app usability, interactive features, and solid trust and security measures.

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Implementation status and compliance level on school child protection policy in Magsaysay Elementary Schools

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Abstract

This study explored the implementation status and compliance level on the school's Child Protection Policy with RA 7610 in Magsaysay Elementary Schools using an exploratory sequential design. The researcher employed complete enumeration to identify 198 participants who are members of the School Child Protection Committee across the 33 public elementary schools. The qualitative aspect of the study was analyzed through a thematic analysis. For the quantitative part, the weighted mean was computed to analyze the descriptive problems using WarpPLS version 7.0. Based on the interview, five main themes emerged, such as awareness and trainings, enforcement, reporting mechanisms, resources, and involvement of stakeholders. The study reveals that schools consistently align their practices with the legal framework, ensuring that child protection policies remain central to day-to-day operations. Also, schools provide appropriate interventions for affected learners. This highlights that compliance extends beyond prevention to include responsive care and recovery measures. Moreover, this study found a generally significant relationship between the implementation status of RA 7610 and school-level compliance. These indicate that the implementation strategies have a consistent, reliable, and visible impact on compliance with the child protection policy, confirming that strong implementation drives effective compliance. Thus, the proposed action plan aligns implementation strategies with compliance requirements. It is recommended that DepEd shift its focus from issuing directives to providing structural support, such as capacity building, legal support, and resource provision. DepEd may introduce digitized reporting to equip schools to respond in real time. Also, schools may shift from basic awareness to functional localized action.

Keywords: Child Protection Policy (CPP), child abuse, children rights, DepEd Order No. 40. s. 2012, Implementation of RA 7610, reporting mechanisms

Implementation status and compliance level on school child protection policy in Magsaysay Elementary Schools

1. Introduction

Child abuse is a social problem prevalent in schools that hinders the opportunity of the child to express and socialize with others and limits learning opportunities in school. It slows down the child's development (Rabina, 2019). The 1987 Philippine Constitution guarantees the protection of children's rights. Later, in 1990, the government ratified the United Nations Convention on the Rights of the Child (CRC), making it one of the first countries to ratify it, which led to the enactment of RA 7610, also known as the Special Protection of Children Against Child Abuse, Exploitation, and Discrimination Act of 1992, which mandates the government and community with the responsibility of child protection. This law provides the legal framework for identifying, reporting, and prosecuting individuals who violate children's rights. The school, considered a second home and a critical environment for human development, bears the primary responsibility for ensuring the safety and well-being of its learners. (Stuart et al., 1995 as cited in Rabina, 2019).

Since its institutionalization, the Child Protection Policy (CPP) has served as the official protocol for case management, the referral system, and the provision of intervention services to victims. However, the existing child protection system in the Philippines is regarded as "top-down," with specific regulations and policies perceived as weak, and its features are being called into question (Roche & Flynn, 2021). Reports from non-governmental organizations (NGOs) and the news media often highlight issues in the proper handling of child protection cases in schools, including delays in reporting, a culture of under- or non-reporting, lapses in investigation, and a lack of trained personnel. Despite the safety nets and reforms, the uncomfortable truth and painful narratives of child abuse victims continue. While the policy is robust on paper, its effectiveness is contingent upon rigorous compliance by school personnel, its practical functionality in real-world scenarios, and schools' capacity to overcome inherent implementation challenges. There must be a policy shift in Child Protection Policy in the schools by addressing the alleged unreported cases of child abuse to reverse the failing performance and noncompliance of the Department of Education (DepEd) in implementing the mandated provisions in RA 7610.

Data from 2023 to 2025 reveals two reported child abuse cases in the Magsaysay District in the form of physical abuse; one remains active, and the other one is already dismissed. It can be concluded from the report that the 2023 child abuse case is still pending resolution, implying that the complexity of the case can hinder the speedy disposition of child abuse cases (P.P. Yumol, personal communication, March 21, 2026). At the very end, the researcher hopes to offer a set of solutions regarding the implementation and compliance of schools with child protection policy under RA 7610, to address child abuse cases in the Magsaysay District.

Statement of the Problem - This study aimed to determine the implementation status and compliance level of the School Child Protection Policy with RA 7610. Specifically, it sought to answer the following questions: (1) What is the implementation status of RA 7610 in Magsaysay Elementary Schools? (2) What is the extent of RA 7610 implementation by the respondent schools in terms of awareness and trainings, enforcement, reporting mechanisms, resources, and involvement of stakeholders? (3) What is the schools' level of compliance with RA 7610 in terms of Policy Relevance, Information Dissemination, Prevention and Protection, Reporting and Referral, Support and Rehabilitation? (4) Is there a significant relationship between the implementation status and the compliance level with RA 7610? (5) What action plan may be proposed for Magsaysay Elementary Schools to further comply with RA 7610 efficiently?

Significance of the Study - The researcher believes that the results of this study will be beneficial to the following: the learners, who will be assured of a safe school where they can freely enjoy learning without fear, and an environment in which they can thrive. To school administrators and principals, the results of the study will

provide school heads with significant information crucial to planning, formulating school policies, and designing appropriate localized interventions to address issues and concerns related to child protection policy. To teachers and school personnel, this study will equip teachers in the performance of their role as duty bearers so that they can confidently attend to and address the challenges of implementing child protection policies at the school level and will enhance their awareness of their roles and responsibilities under the CPP and RA 7610, fostering a proactive approach to child protection. For parents and guardians, this study will make them aware of their vital role as partners with the school in establishing a safer school environment and promoting trust in the system to protect their children. To DepEd and policymakers, the results of the study will help the division offices introduce policy recommendations and develop an immediate intervention and catch-up plan, a strategic technical assistance plan, and a human resource learning and development plan, all designed for short-, medium-, and long-term ranges. For Child Protection Committees (CPCs), the study will highlight specific areas of non-compliance, enabling them to address challenges immediately and improve their compliance. To the Local Government Unit of Magsaysay, the results of this study will guide the LGU in crafting a localized child protection policy to strengthen the strategic intervention and mitigation plan. To the Sangguniang Bayan/Barangay Council, this study will help the Violence Against Women and Children (VAWC) Desk to develop a localized plan to prevent and address violence against women and children. For future researchers, this study can serve as a foundational reference for further academic inquiry into educational law, policy implementation, and child welfare in the Philippines.

Scope and Delimitation of the Study - This study focuses on the implementation status and compliance level of school child protection policies with RA 7610 in public elementary schools in the Magsaysay District, Division of Occidental Mindoro. The scope includes the extent to which the respondent schools have implemented RA 7610 in the following focus areas: awareness and training, enforcement, reporting mechanisms, resources, and stakeholder involvement. Further, this study covered the level of compliance of schools with policy relevance, information dissemination, prevention and protection, reporting and referral, and support and rehabilitation, as stipulated in the Implementing Rules and Regulations (IRR) of RA 7610 and DepEd Order No. 40, s. 2012. Furthermore, the study focuses on the correlations between implementation status and compliance levels of the Child Protection Policy among schools in the Magsaysay District. This study is limited to the perspective of the 198 members of the School Child Protection Committee from the 33 public elementary schools in Magsaysay. The perspective of external agencies was not included in the study, and there is no discussion of basic information on child abuse cases, as this is governed by the Data Privacy Act of 2012. The study also excluded legal analysis or review of specific closed court cases related to RA 7610. The study covered the School Year 2025-2026.

2. Methodology

Research Design - This study used an exploratory sequential research design. Basically, the study had two phases: a qualitative phase and a quantitative phase, with the qualitative phase involving the collection and analysis of qualitative data first, followed by the collection and analysis of quantitative data. This exploratory sequential design was used to help the researcher explore a phenomenon or generate hypotheses before testing them with quantitative data (Creswell & Plano Clark, 2018). The gathering of information and interpretation of data guided the researcher in the early qualitative stage. This helped the researcher design a tailored survey and select appropriate existing measures for the project's quantitative stage. It also makes clear which variables must be investigated quantitatively in subsequent research (Creswell & Creswell, 2018). Moreover, the research design helped the researcher assess the implementation status and compliance levels of schools in the Magsaysay District with RA 7610 in implementing child protection policies.

Respondents of the Study - For the qualitative phase of the study, after the proper offices approved the request, an interview was conducted with 15 randomly selected respondents from the San Jose North and South Districts. The participants of the study were the 198 members of the School Child Protection Committees from 33 elementary schools in the Magsaysay East and West Districts. The researcher employed complete enumeration. Each committee is composed of the School Head, Guidance Counselor/Guidance Designate, Teacher Representative, Parent Representative, Student Representative, and Community/Barangay Representative. Each committee

comprises 6 members, selected from the 198 participants in this study.

Research Instrument - The first instrument used in this study was the interview guide. The interview was conducted with targeted elementary schools in the San Jose South and North Districts, which were asked to share the implementation status of the child protection policy under RA 7610 in their respective schools. The researcher designed the Implementation and Compliance Survey Questionnaire, which is divided into two parts and consists of five variables, with six questions per variable. The terms found in the provisions of RA 7610, the readings from other related literature, and the results of the interview served as the basis for crafting the Implementation and Compliance Survey Questionnaire. This researcher-made questionnaire, consisting of 10 scales with 6 items, was used to assess the implementation status and compliance level with the child protection policy under RA 7610.

The created instrument underwent expert validation. The researcher sought the expertise and insights of three professors from the Divine Word College of San Jose Graduate School to ensure the clarity and appropriateness of the questionnaire statements. Also, the researcher asked the DepEd Supervisor in charge, in Filipino, to look into translating the statements into the local language. The feedback and recommendations they provided were incorporated into the draft questionnaire to enhance its potential to generate valuable data for the research. The reliability of the research instrument was assessed using Cronbach's alpha for standardized items. Thirty (30) respondents were asked to answer the 60-item questionnaire. The results were divided into two main parts: the implementation status and the compliance level of the School Child Protection Policy.

Table 1 presents the results of the reliability analysis for the 10 scales, each with 6 items.

Table 1

Result of Reliability Analysis

Items	Number of Items	Reliability Coefficients*	Analysis
I. Implementation Status of School on Child Protection Policy (6 items each)			
1. Awareness and Trainings	6	0.833	High Reliability
2. Enforcement	6	0.741	High Reliability
3. Reporting Mechanisms	6	0.730	High Reliability
4. Resources	6	0.706	High Reliability
5. Involvement of Stakeholders	6	0.907	Very High Reliability
II. Level of Compliance of the School on Child Protection Policy (6 items each)			
1. Relevance	6	0.944	Very High Reliability
2. Information Dissemination	6	0.866	High Reliability
3. Prevention and Protection	6	0.907	Very High Reliability
4. Reporting and Referral	6	0.967	Very High Reliability
5. Support and Rehabilitation	6	0.945	Very High Reliability

*Based on standardized items

The reliability coefficients from 0.706 to 0.967 indicate that all 10 scales have met and exceeded the generally accepted threshold of 0.70 for internal consistency. In the first part, the involvement of stakeholders had the highest coefficient (0.907), indicating a very high degree of internal consistency among the items measuring the implementation status construct. The lowest coefficient is for resources (0.706), which is at the lower end of the acceptable range, yet it remains statistically reliable. In the second part, reporting and referral show the strongest internal consistency (0.967), indicating that the six descriptors in this scale are highly interrelated and accurately measure the construct. The high coefficients across all compliance variables, ranging from 0.866 to 0.967, suggest that the instrument is highly stable and dependable for assessing the school's adherence to child protection policy. In summary, the instruments for both implementation status and level of compliance demonstrate consistency and accurately measure their intended constructs. This result ensures that the data collected from these scales are reliable for further statistical analysis.

Data Gathering Procedure - The researcher sought permission to conduct the study from the Office of the Schools Division Superintendent, the Public Schools District Supervisors, and the School Heads of the sample schools. Approval and recommendation from the graduate school's panel of examiners were secured before the

administration. The researcher used a single question and collected responses online for the qualitative phase. The qualitative data were gathered through interviews with members of the child protection committee and subjected to thematic analysis. Recording, transcription, tabulation, and coding were done to extract the themes. The initial, developing, and final thematic maps were illustrated to identify the final themes. The qualitative data collection was conducted over a period of two weeks. Letters of request to conduct the study were forwarded to the Schools Division Superintendent of Occidental Mindoro and Public Schools District Supervisors of Magsaysay East and West Districts. Upon approval, permission from the school heads in the Magsaysay District was secured before the data collection. To gather the data, the survey questionnaire checklist was circulated through an online platform. The responses were compiled, organized, and statistically analyzed to support the study's findings. The quantitative data collection was also conducted over a period of two weeks.

Statistical Treatment of the Data - The qualitative data gathered through interviews with the participants underwent thematic analysis. Recording, transcription, tabulation, and coding were done to extract the themes. The initial, developing, and final thematic maps were used to identify the final themes. The researcher used descriptive statistics, such as the weighted mean, to summarize the schools' implementation status of the Child Protection Policy. To test the hypothesis, a correlational analysis was used to assess implementation status and compliance with RA 7610 using Partial Least Squares Structural Equation Modeling (PLS-SEM) in WarpPLS version 7.0.

Ethical Considerations - This study strictly adhered to the ethical standards in research. Proper citations were used correctly. The permit to conduct the study was obtained from the appropriate authorities prior to this research. The respondents' voluntary involvement in the study was valued and treated with utmost confidentiality, and strict adherence to the Data Privacy Act of 2012 was observed. The respondents have the right, at any time, to withdraw from this study and are not obligated to disclose the reason(s) for their withdrawal. The researcher ensured anonymity for all participants, especially students, and managed the data with the utmost confidentiality to prevent any harm arising from their participation. The researcher was aware that in any case during the interview, it was his obligation to report any disclosed case of ongoing child abuse or neglect, which superseded the promise of confidentiality as provided for in RA 7610. A disclaimer was included in the questionnaires that clearly states that particular provision.

3. Results and Discussions

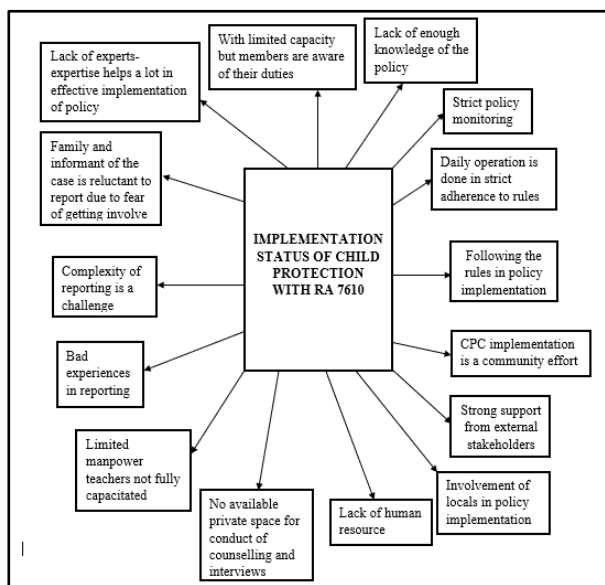


Figure 1. Initial Thematic Map of Implementation Status of RA 7610

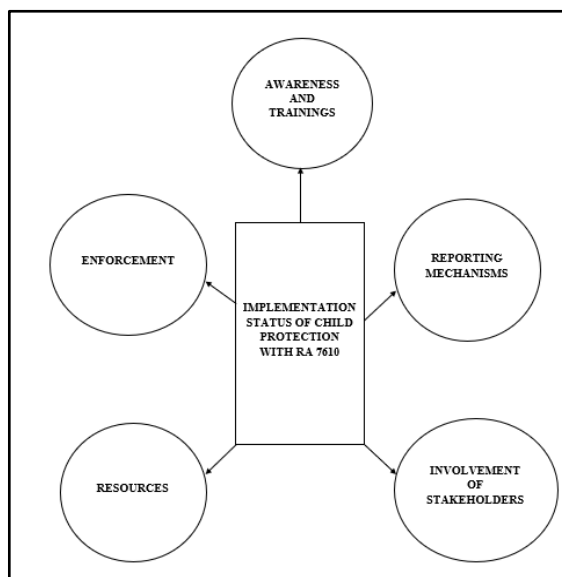


Figure 1. Final Thematic Map of the Implementation Status of RA 7610

Figure 1 summarizes the implementation status of the school child protection policy with RA 7610. It reports on the implementation status of the child protection policy in each school. The map outlines the reasons for assessing participants' implementation status. This is supported by a study by Galanza (2025), who noted that while most schools have established Child Protection Committees, challenges such as inadequate training, limited resources, and lack of awareness hinder effective implementation. Further, cultural factors, societal norms, and bureaucratic constraints were identified as additional barriers to compliance. Moreover, the final thematic map for implementation status is an updated version that reflects the analysis and refinement of the initial thematic diagram. It presents the five final themes derived from the analysis of the implementation status of schools' Child Protection Policy with RA 7610. These final themes, namely awareness and training, enforcement, reporting mechanisms, resources, and the involvement of stakeholders, represent the implementation status of schools' Child Protection Policy in Magsaysay Districts. The final thematic map serves as the summary of the analysis and provides a clear visual representation of the implementation status. The extracted final themes summarize the implementation status in public schools. This aligns with the findings of Cervancia et al. (2019), who reported that many institutions struggle to establish effective reporting and monitoring systems.

Additionally, literature emphasizes the role of information systems and monitoring mechanisms in strengthening referral processes. Data systems allow institutions to track reported cases, monitor progress, and evaluate outcomes, ensuring that no case is overlooked. Effective child protection systems integrate reporting, referral, and data management processes to enhance service delivery and accountability (Fegert & Stötzel, 2016).

Table 2 shows the mean extent of RA 7610 implementation by the respondent schools. It could be noted from the given table that four indicators such as awareness and trainings, enforcement, reporting mechanisms, and involvement of stakeholders gained a composite mean of 4.35, Very High, implying that the majority of the school respondents in Magsaysay Districts, strictly enforcing rules, consistently conducting awareness and training program and with a functional reporting mechanisms relative to RA 7610 that involves internal and external stakeholders as partners within and outside the academic community. The Bottom-Up Approach Theory supports this finding. Effective and sustainable policy implementation emerges from the active participation of local actors, rather than being imposed solely through hierarchical directives. In other words, grassroots involvement and community empowerment are fundamental to sustainable development, as policies gain legitimacy when they are co-owned by those directly affected. It highlights that compliance is not merely a matter of institutional enforcement but also of community effort, in which teachers, parents, and learners collectively shape the implementation process (Isidiho et al., 2016).

Table 2
Mean Extent of the RA 7610 Implementation in Terms of Awareness and Trainings, Enforcement, Reporting Mechanisms, Resources, and Involvement of Stakeholders

Awareness and Trainings	Weighted Mean	Interpretation
1. The school conducts an annual orientation for learners regarding the child protection policy.	4.53	Very High
2. The school personnel regularly attend/participate in specialized child protection seminars.	4.37	Very High
3. There is available Information, Education, and Communication (IEC) material on child protection that is accessible to all.	4.22	Very High
4. "No to Bullying" posters are posted in conspicuous places on the school campus.	4.35	Very High
5. The school observes integration of child protection topics (e.g., body safety, online safety) into the curriculum.	4.56	Very High
6. School personnel can mentally recall the specific steps for handling cases of abuse.	4.39	Very High
Composite Mean	4.40	Very High
Enforcement		
1. School personnel consistently observe the Code of Conduct for School Personnel regarding learners' interaction.	4.66	Very High
2. The designated watchman regularly conducts monitoring of high-risk areas such as secluded corners and vacant rooms.	4.31	Very High

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3. The school is regularly reviewing the functionality of the child-protection protocols.	4.35	Very High
4. The school imposes immediate administrative action against personnel who violate the child protection protocol.	4.44	Very High
5. The school strictly implements the “No Corporal Punishment” policy.	4.57	Very High
6. The school implements monitoring systems such as the wearing of IDs and a Visitor’s logbook for all campus entrants.	4.31	Very High
Composite Mean	4.44	Very High
Reporting Mechanisms		
1. The school has a clear process flow for reporting of incidents of abuse.	4.41	Very High
2. The school has a functional “Suggestion/Report Box” that is accessible to all.	3.96	High
3. The school uses prescribed intake forms to document reported incidents of child abuse.	4.36	Very High
4. The school personnel observe immediate reporting of cases of violations to the proper authorities.	4.52	Very High
5. The school personnel observe the confidentiality of the names of the parties involved.	4.52	Very High
6. The school has a designated Child Protection Focal Person to handle reported cases of abuse.	4.51	Very High
Composite Mean	4.38	Very High
Students’ Engagement		
1. The teacher clearly explains learning objectives at the beginning of each lesson	4.82	Very High
2. Classroom rules and procedures are consistently enforced	4.77	Very High
3. The teacher uses various teaching methods to keep students interested	4.85	Very High
4. Students receive timely and helpful feedback on their work	4.90	Very High
5. Students actively participate in class discussions that enhance their overall development.	4.81	Very High
6. Students demonstrate passion, curiosity, eagerness for acquiring new knowledge, enthusiasm, and interest in learning	4.91	Very High
7. Students ask questions and seek help when they do not understand	4.83	Very High
8. Students seek clarification whenever concepts are not clear to me.	4.93	Very High
9. The classroom environment supports collaborative learning among students	4.89	Very High
10. Students demonstrate persistence when working on challenging tasks	4.82	Very High
Composite Mean	4.85	Very High
Resources		
1. The school has a dedicated Guidance Office for counseling.	3.95	High
2. There is an updated referral directory for local police and social workers (DSWD).	4.11	High
3. The school allocates funds to support psychological first aid services.	4.01	High
4. The learner who shows signs of distress has access to psychological first aid or counseling services.	4.05	High
5. Professional development materials, such as manuals and legal guides, are made accessible for staff reference.	4.06	High
6. The school has gender-segregated and lockable comfort rooms to ensure privacy.	4.36	Very High
Composite Mean	4.09	High
Involvement of Stakeholders		
1. The Parents-Teachers Association (PTA) actively participates in child protection efforts of the school.	4.55	Very High
2. The school collaborates with the Barangay Council for the Protection of Children (BCPC) for off-campus safety.	4.53	Very High
3. The school involves local elders/tribal leaders in child protection policy-making.	4.32	Very High
4. The school regularly conducts consultations with parents regarding the school’s safety performance and policy updates.	4.47	Very High
5. The school has a partnership agreement with health units in cases of medical emergencies.	4.30	Very High
6. The school includes community members in community-led implementation of child protection policy.	4.40	Very High
Composite Mean	4.43	Very High
Overall Mean	4.35	Very High

Scale: 4.20-5.00 Very High; 3.40 -4.19 High; 2.60-3.39 Moderate; 1.80-2.59 Low; 1.00-1.79 Very Low

It could be noted that enforcement obtained the highest composite mean score of 4.44 (Very High). This implies that schools are successful in enforcing the child protection policy. Regulatory enforcement actions are

agency responses to violations aimed at ensuring compliance. As these actions are among the most visible forms of regulatory intervention, they can influence citizens' trust in regulatory agencies (Grimmelikhuijsen et al., 2025). Meanwhile, the lowest composite mean score is 4.09 (High), implying that the schools have effectively managed their resources. The result is consistent with the study by Shigali et al. (2023), which found that in the policy implementation process, the role of resources cannot be ignored. Resource allocation is a key component of strategic implementation in organizations, involving the distribution of available physical, financial, and technological resources to support organizational goals. In public-sector contexts, studies have shown that effective resource allocation is associated with improved service delivery, particularly when governments invest in infrastructure, equipment, and technology. Additionally, Nyadeje's (2014) study found no correlation between strategic plan implementation and resource availability. Additionally, the same results were found in the study by Shigali et al. (2023), which showed that resource allocation in the implementation of a strategic plan is significantly related to effective administration.

Table 3 shows the mean level of Compliance with RA 7610. It could be noted from the given table that all five indicators, such as relevance, information dissemination, prevention and protection, reporting and referral, and support and rehabilitation, yielded a composite mean of 4.43, interpreted as Very High, implying that all respondent schools in Magsaysay District are highly compliant with the mandates of RA 7610 and DepEd Order No. 40, s. 2012, relative to five variables: relevance, information dissemination, prevention and protection, reporting and referral, and support and rehabilitation. This is revealed in Ojo et al. (2025), which reports a significant positive relationship between administrative strategies and the implementation of child protection policies. The findings provided compelling evidence of the vital role that administrative leadership and legal awareness play in child protection within schools. These administrative strategies, such as proactive supervision, staff training, and clear reporting procedures, were strongly associated with better implementation of protection policies.

Table 3

Mean Level of Compliance with RA 7610 in terms of Policy Relevance, Information Dissemination, Prevention and Protection, Reporting and Referral, and Support and Rehabilitation

Policy Relevance	Weighted Mean	Interpretation
1. The school has a formulated School Child Protection Policy (CPP).	4.42	Very High
2. The school's Child Protection Policy (CPP) is formally adopted and reviewed regularly as required every three years.	4.39	Very High
3. There is a clear provision in the School Child Protection Policy that states a ZERO TOLERANCE policy against all forms of abuse, exploitation, discrimination, and violence against children.	4.46	Very High
4. The school has a Child Protection Committee (CPC), clearly stating the roles and responsibilities of members, which are defined in the policy.	4.48	Very High
5. The school's CPP provides specific acts of abuse or exploitation against children, including those acts not covered in DepEd issuances and state laws.	4.37	Very High
6. The school integrates community culture and traditions in the policy as required by law.	4.43	Very High
Composite Mean	4.43	Very High
Information Dissemination		
1. All teaching and non-teaching personnel receive mandatory annual training/orientation on the DepEd's CPP.	4.24	Very High
2. Learners, especially new enrollees, receive an orientation on the rights and privileges related to child protection.	4.38	High
3. CPP posters/visuals displaying the reporting mechanisms (e.g., CPC contact, Police Hotline, DSWD Hotline) are visibly displayed in conspicuous places accessible to learners and school personnel.	4.28	Very High
4. The school conducts orientation for visitors or individuals not affiliated with the school about the child protection policy of the school.	4.12	High
5. Parents/Guardians/School Personnel receive orientation on the provisions of the CPP.	4.36	Very High
6. The school and the LGU maintain close coordination as regards the existing school child protection policy.	4.42	Very High
Composite Mean	4.30	Very High

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Prevention and Protection		
1. The school employs a positive discipline program.	4.59	Very High
2. Teachers are capacitated to determine the physical, behavioral, and emotional signs of child abuse or neglect as defined in DepEd Orders and other state laws.	4.49	Very High
3. The school enforces strict measures to prevent unsupervised interaction between staff and learners during official school activities within and outside of the school premises.	4.48	Very High
4. The school has a functional system for identifying and monitoring learners who are at high risk of abuse, such as children with disabilities and children in armed conflict areas.	4.32	Very High
5. The school ensures all personnel, regardless of their employment status, receive orientation and strictly adhere to the child protection policy of the school.	4.50	Very High
6. The school has safety protocols that guide the teachers in the proper handling of actual cases.	4.37	Very High
Composite Mean	4.46	Very High
Reporting and Referral		
1. The CPC ensures that all reports of abuse are documented and handled with strict confidentiality.	4.49	Very High
2. The school observes proper protocol for mandatory and immediate reporting of suspected or actual child abuse cases to the appropriate external agency (PNP, DSWD) within the required timeframe.	4.57	Very High
3. The child victim's right to be heard is respected and facilitated in all investigations and proceedings.	4.57	Very High
4. The school employs a child-based rights approach during coordination with the local police (WCPD) and DSWD during the investigation of abuse cases.	4.49	Very High
5. The school immediately refers the alleged perpetrator (staff/teacher) for placement on preventive suspension/leave pending investigation.	4.46	Very High
6. The school ensures the application of due process of law and exercises extraordinary diligence when reporting and referring cases.	4.48	Very High
Composite Mean	4.51	Very High
Support and Rehabilitation		
1. The school ensures immediate access to psychological and counseling services for the child-victim-survivor and their family.	4.44	Very High
2. The school implements measures to ensure the continuation of the education of the child-victim and the perpetrator in case of peer-to-peer abuse.	4.45	High
3. The school implements restorative justice principles, focusing on reconciliation without compromising the safety of the victim.	4.42	Very High
4. There are clear procedures for the rehabilitation and intervention for child perpetrators in case of peer-to-peer abuse/bullying.	4.41	Very High
5. The school consistently monitors the well-being of the victim/survivor to prevent retaliation.	4.42	Very High
6. The school ensures the reintegration of the victim-survivor and perpetrator in case of peer-to-peer abuse into the school environment with minimal disruption.	4.41	Very High
Composite Mean	4.43	Very High
Overall Mean	4.43	Very High

Scale: 4.20-5.00 Very High; 3.40 -4.19 High; 2.60-3.39 Moderate; 1.80-2.59 Low; 1.00-1.79 Very Low

The highest composite mean could be attributed to the reporting and referral indicators, with a mean score of 4.51, interpreted as Very High. Literature emphasizes the role of information systems and monitoring mechanisms in strengthening referral processes. Data systems allow institutions to track reported cases, monitor progress, and evaluate outcomes, ensuring that no case is overlooked. Effective child protection systems integrate reporting, referral, and data management processes to enhance service delivery and accountability (Fegert & Stötzel, 2016). The lowest composite mean could be attributed to the "information dissemination" indicator, with a mean score of 4.30, interpreted as Very High. Studies show that effective communication and dissemination of the Child Protection Policy elevate stakeholders' awareness, thereby improving compliance and school responsiveness (Asio et al., 2020). Communication strategies are central to child protection implementation, as they enhance awareness, accountability, and the translation of policy into practice at the institutional and community levels (Save the Children, 2015).

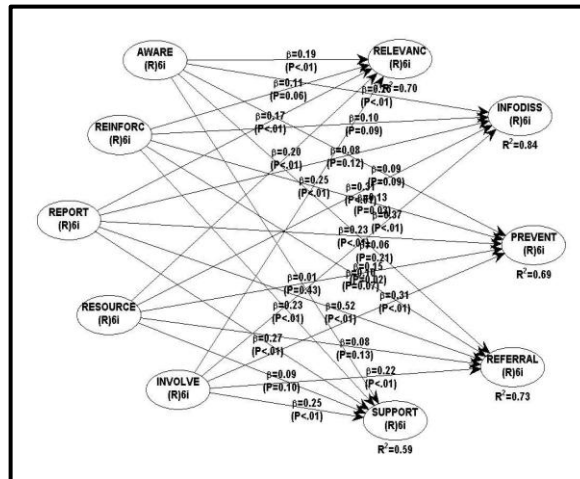


Figure 3. Structural Model of the Relationship Between Implementation Status of RA 7610 and Level of Compliance

The structural equation model (SEM) in Figure 3, generated using WarpPLS version 7.0, illustrates the relationship between the exogenous variable, implementation status of RA 7610, and the endogenous variable, level of compliance with RA 7610. The five predictor variables include awareness and training (AWARE), enforcement (REINFORC), reporting mechanisms (REPORT), resources, and stakeholder involvement (INVOLVE). A total of 25 paths connect to the compliance variables: relevance (RELEVANC), information dissemination (INFODISS), prevention and protection (PREVENT), reporting and referral, and support and rehabilitation (SUPPORT). The results provide the path coefficients indicating the strength of the relationship and the p-values, which determine if that relationship is statistically significant ($p < .05$). The beta () values range from 0.012 to 0.517. The R2 values represent the proportion of variance in each outcome explained by the predictors, and they ranged from .59 to .84, indicating the model’s high explanatory power. However, several paths show $p > 0.05$, meaning the relationships are not statistically significant in this specific model.

Table 4
Beta Coefficients of the Paths and p-values for H_0

Paths	Beta (β) Coefficient	p-value*	Interpretation
Ho: Implementation Status of RA 7610 → Level of Compliance			
AWARE→RELEVANC	0.193	.003	Significant
AWARE→INFODISS	0.259	<.001	Highly Significant
AWARE→PREVENT	0.095	.088	Not Significant
AWARE→REFERRAL	0.057	.211	Not Significant
AWARE→SUPPORT	0.012	.433	Not Significant
REINFORC→RELEVANC	0.106	.064	Not Significant
REINFORC→INFODISS	0.096	.085	Not Significant
REINFORC→PREVENT	0.134	.027	Significant
REINFORC→REFERRAL	0.102	.072	Not Significant
REINFORC→SUPPORT	0.232	<.001	Highly Significant
REPORT→RELEVANC	0.173	.006	Significant
REPORT→INFODISS	0.084	.115	Not Significant
REPORT→PREVENT	0.229	<.001	Highly Significant
REPORT→REFERRAL	0.517	<.001	Highly Significant
REPORT→SUPPORT	0.266	<.001	Highly Significant
RESOURCE→RELEVANC	0.201	.002	Significant
RESOURCE→INFODISS	0.308	<.001	Highly Significant
RESOURCE→PREVENT	0.146	.018	Significant
RESOURCE→REFERRAL	0.081	.126	Not Significant
RESOURCE→SUPPORT	0.090	.099	Not Significant
INVOLVE→RELEVANC	0.254	<.001	Highly Significant
INVOLVE→INFODISS	0.373	<.001	Highly Significant
INVOLVE→PREVENT	0.312	<.001	Highly Significant
INVOLVE→REFERRAL	0.220	<.001	Highly Significant
INVOLVE→SUPPORT	0.248	<.001	Highly Significant

*Significant at $p < 0.05$

Table 4 presents the path coefficients and p-values for testing the null hypothesis that the implementation status of RA 7610 does not affect schools’ compliance levels across various indicators. Stakeholders’ involvement is the most consistent and powerful predictor, as all paths to compliance indicators are highly significant ($p < .001$). The strong relationship is with information dissemination, suggesting that when stakeholders are actively involved, the spread of policy information is most effective. Another driver of functional compliance is the reporting mechanism, which has a moderate path coefficient for referral. This implies that the existence and implementation of clear reporting channels are the primary reason referral systems for child protection actually work. Resource allocation also significantly impacts information dissemination, relevance, and prevention and protection. This proves that financial and material support are essential to making the policy feel relevant and to ensuring it is properly publicized.

However, the implementation of RA 7610 in terms of awareness falls short in prevention, referral, and support, all with $p > .05$. This suggests that simply knowing about RA 7610 does not mean the school will actually support victims or refer cases. Awareness must be paired with action-oriented variables like reporting and involvement. Enforcement is seen as a weak predictor, as it does not significantly affect relevance, information dissemination, or referral ($p > .05$). However, it shows strength in providing support. Any gap in awareness raises concerns about how effectively government agencies disseminate updates and how organizations ensure employees are well informed (Tan, 2023, as cited in Capillan et al., 2025). Insufficient knowledge of policies often leads to confusion and misinformation. (Capillan et al., 2025). To address the awareness gap, policy implementation must include employee training to yield better organizational results. The impact of training and development on employee performance has been extensively studied in various organizational contexts, shedding light on its significant influence on individual proficiency and organizational effectiveness, training and development initiatives play a crucial role in enhancing employee performance by equipping individuals with essential skills, knowledge, attitudes, and talents necessary for their roles (Wulnye et al., 2018) Because more than half of the tested paths, 16 out of 25 total paths, show a p-value below 0.05, the statistical decision leads to the partial rejection of the null hypothesis.

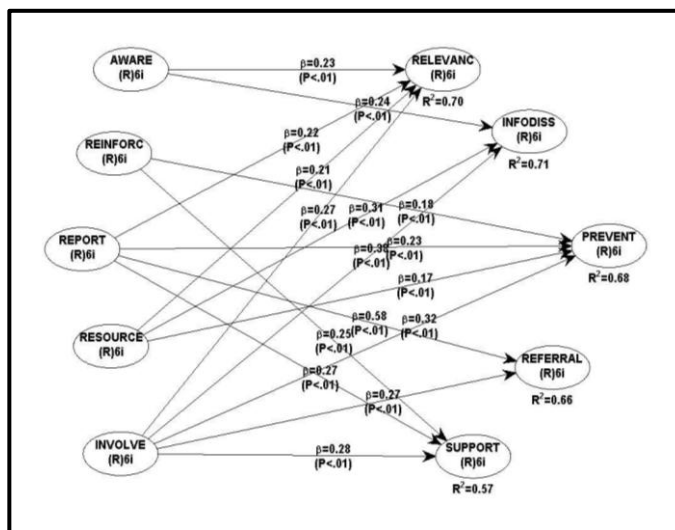


Figure 4. The Emerging Model of the Finalized Structural Relationship Between the Implementation Variables and the Compliance Outcomes

The emerging model in Figure 4 demonstrates the finalized structural relationship between the implementation variables and the compliance outcomes. In this new model, all paths are statistically significant ($p < 0.01$), indicating a refined and highly reliable framework for school policy compliance. The coefficients of determination (R^2 values) represent the explanatory power of the model. The values slightly decreased from the initial .59 to .84 to the emerging model’s results, with R^2 of .57 to .71. The path coefficients range from 0.183 to 0.578, indicating the strength of the influence of implementation status on compliance level. Thirteen paths show $p < .01$, indicating

the strength of implementation's influence on compliance.

Table 5*Standardized Estimates of the Path in the Emerging Model*

Hypothesis	Standardized Estimates (β)	Standard Error	p-value*	Effect Coefficient**	Effect Size
Ho: Implementation Status of RA 7610 → Level of Compliance					
AWARE→RELEVANC	0.225	.068	<.001	.169	Medium
AWARE→INFODISS	0.238	.068	<.001	.175	Medium
REINFORC→PREVENT	0.183	.069	.004	.139	Small
REINFORC→SUPPORT	0.252	.068	<.001	.178	Medium
REPORT→RELEVANC	0.222	.068	<.001	.167	Medium
REPORT→PREVENT	0.232	.068	<.001	.176	Medium
REPORT→REFERRAL	0.578	.064	<.001	.460	Large
REPORT→SUPPORT	0.275	.067	<.001	.197	Medium
RESOURCE→RELEVANC	0.207	.068	.001	.149	Medium
RESOURCE→INFODISS	0.308	.067	<.001	.234	Medium
RESOURCE→PREVENT	0.166	.069	.008	.114	Small
INVOLVE→RELEVANC	0.273	.067	<.001	.212	Medium
INVOLVE→INFODISS	0.378	.066	<.001	.297	Large
INVOLVE→PREVENT	0.325	.067	<.001	.253	Medium
INVOLVE→REFERRAL	0.270	.067	<.001	.199	Medium
INVOLVE→SUPPORT	0.282	.067	<.001	.198	Medium

*Significant at $p \leq 0.05$

** Effect size coefficient: 0.02 – small, 0.15 – medium, 0.30 – large

Table 5 summarizes the standardized estimates of the paths in the emerging model, representing the refined relationships in which all paths are statistically significant. It shows the beta values, which indicate the strength and direction of the relationships. Higher values signify a more dominant influence. The effect coefficient indicates the significance of the predictor's contribution to the outcome. The most dominant relationship in the emerging model is between the reporting mechanism and referral. The effect is large with a coefficient of .460. It confirms that the reporting mechanism is the single most significant driver for a functioning referral system, suggesting that if the reporting process is clear, referrals happen. Reporting mechanisms also reveal medium effects on relevance (.167), prevention (.176), and on support and rehabilitation (.197). Nearly reaching the .30 large threshold (0.297), stakeholders' involvement correlates significantly with information dissemination. This shows that stakeholder involvement is the most effective way to disseminate information. Stakeholder involvement is also considered a consistent predictor, with medium to large effect sizes (.198 to .297), of the school's level of compliance with RA 7610.

Twelve (12) paths fall in the .15 to .25 effect range. These indicate that these implementation strategies have a consistent, reliable, and visible impact on compliance. Enforcement shows a positive effect on support and rehabilitation (.178), suggesting that consistent follow-up is necessary to sustain help for affected students. While statistically significant, the paths from enforcement to prevention (.139) and from resources to prevention (.114) have a smaller practical impact on prevention than the medium effects of reporting (.176) and stakeholders' involvement (.253). Stakeholder involvement is the primary driver of both active prevention and victim support, showing that people's concerns are more effective than policy rules alone. Resources contribute a medium effect on information dissemination (.234) and relevance (.149), indicating that information dissemination is heavily dependent on material and financial resources, such as printing materials, internet access, and training funds. Awareness shows consistent, moderate influence and medium effect across relevance and information dissemination. It serves as the foundation but is rarely the strongest driver of action-oriented outcomes such as support or referrals.

The p-values are very low, concluding that the correlations are highly stable across the population of schools studied. The recorded standard error values, ranging from .064 to .069, are consistently low and very similar across all paths, which is a very good sign for this research study. It indicates high precision in the estimates, as small standard errors suggest that, if the study were repeated, the results would likely be very similar, thereby enhancing

the credibility of the emerging model.

Based on the standardized estimates and p-values, the results support rejecting the null hypothesis. There is generally a significant relationship between the implementation status of RA 7610 and the level of its compliance in schools. These indicate that the implementation strategies have a consistent, reliable, and visible impact on compliance with the child protection policy. The Governance Network Theory, as applied in policy implementation, will help policy implementers to understand the complexity of child protection. The theory views policy implementation as a complex web of interdependent and interconnected networks. Since it is based on the premise that no single organization can address common governance challenges, education leaders must shift from being in control to being the network manager who brings the right people together to form collaborative governance (Kapucu et al., 2020).

Table 6

Proposed Action Plan to further comply efficiently with RA 7610

Action/ Intervention	Description	Timeline (SY 2026– 2027)	Focal Persons	Resources Needed	Budget Allocatio n	Monitoring & Evaluation	Expected Outputs
Orientation & Re-orientation on RA 7610 and DepEd Child Protection Policy	Quarterly awareness sessions for teachers, parents, and learners	June-July	School Heads, Guidance Counselors, CPC	IEC materials, projector, venue	₱15,000/year	Attendance sheets, pre/post-tests, feedback forms	Stakeholders oriented on child protection
Strengthening Child Protection Committees (CPC)	Formal designation, activation, and monitoring of CPCs	July	School Heads, Teachers, PTA Officers	DepEd forms, designation materials	₱5,000/year	CPC reports, minutes of meetings	Active CPCs in all schools
Teacher Training Workshops	Capacity-building on handling child abuse cases and reporting	July- August	Division Child Protection Officers, School Heads	Resource speakers, modules	₱20,000/year	Post-training evaluation, classroom observation	Teachers trained in case handling
Homeroom Guidance Integration	Monthly sessions on child rights and protection	August– April	Class Advisers, Guidance Counselors	Lesson guides, activity sheets	₱5,000/year	Learner outputs, teacher reports	Learners demonstrate child protection awareness
Parent Education Sessions	Seminars on positive discipline and RA 7610	September– April	CPC, PTA, Guidance Counselors	IEC materials, venue, speakers	₱15,000/year	Parent feedback, monitoring of discipline practices	Parents adopt positive discipline
Partnerships & Linkages	Coordination with LGU, Barangay Council, PNP Women & Children Desk	September– April	School Heads, CPC, and LGU officials	MOUs, referral documentat ion	5,000/ per year	Documentation of referrals, signed MOUs	Strengthened community partnerships
Resource Mobilization	Conduct of strategic resource allocation training & workshops	April-May	School Heads, CPC	Training Resource Package	15,000/ year	Post-training evaluation, classroom observation	Capacitated School Heads and CPC members
Confidential Reporting Mechanisms	Drop boxes, hotline posters, referral pathways	September– April	CPC, Guidance Counselors	Hotline posters, drop boxes	10,000/ per year	Number of reports received, follow-up actions	Secure and confidential reporting
Annual Compliance Audit	End-of-year audit of RA 7610 implementation	March–April	School Heads, Division Office	Audit tools, reports	5,000/ per year	Audit results, recommendations implemented	Compliance gaps identified and addressed

Source: (DepEd Order No. 44, s. 2015). Guidelines on the preparation of the school improvement plan (SIP) and the Annual Implementation Plan (AIP)

The consolidated action plan provides a holistic framework that integrates interventions, timelines, focal persons, resources, budget allocations, and monitoring mechanisms into one unified structure. By merging the three tables, the plan ensures that activities are not only well-defined but also systematically scheduled and evaluated. This integration reflects the principles of DepEd Order No. 44, s. 2015, which emphasizes that school improvement plans must align interventions with clear timelines, resource allocation, and monitoring strategies. The plan begins with awareness and training activities, such as quarterly orientations and the integration of homeroom guidance. These interventions ensure that teachers, parents, and learners are continuously informed about RA 7610 and child protection policies. A study by Kumar et al. (2016), as cited in Ojo et al. (2024), found that staff trained in child protection were more confident and effective at creating safe learning environments.

Meanwhile, enforcement and monitoring are operationalized by strengthening Child Protection Committees (CPCs) and conducting annual compliance audits. These mechanisms ensure accountability and adherence to DepEd Orders. Rande (2025) suggested that the success of policy implementation is influenced not only by the existence of regulations but also by stakeholder synergy, implementers' commitment, and effective communication strategies. Further, resource allocation and support are embedded in training workshops, IEC materials, and audit tools. Adequate resources are critical for policy implementation. Resource availability and allocation are significant predictors of performance in the devolution of public-sector services. However, this important aspect was not taken seriously; the resource allocation strategies employed were inappropriate, and the most disturbing finding was that resources were not always available when needed (Korir & Bett, 2018).

Furthermore, Stakeholder involvement is addressed through parent education sessions and partnership linkages with LGUs, Barangay Councils, and the PNP Women & Children Desk. This collaborative approach ensures that child protection is not confined to the school but extends to the community. Further, Khayatzaadeh et al. (2020) proposed that stakeholder involvement is highly context-dependent and must be tailored to the needs and goals of specific projects. Stakeholders' dialogue highlighted the inherent challenges of co-framing and knowledge co-production through the meaningful engagement of multiple stakeholders with different ideas and interests. The study further highlighted the importance of dialogue in addressing differences among stakeholders and facilitating the co-production of knowledge, especially when stakeholders have diverse interests and perspectives (Khayatzaadeh et al., 2020). Finally, confidential reporting mechanisms guarantee accountability and protection through drop boxes, hotlines, and referral pathways. This aligns with UNICEF's (2023) study, which highlighted that accessible and confidential reporting systems are vital for safeguarding children in the educational system. Additionally, anonymous reporting systems have been widely used in schools to promote the safe reporting of sensitive issues, further highlighting the importance of anonymity in encouraging disclosures (Messman et al., 2022).

4. Conclusions

Based on the summary of the findings presented, the following are the conclusions of the study. The final themes regarding the implementation status of RA 7610 were: awareness and training, enforcement, reporting mechanisms, resources, and stakeholder involvement. The respondent schools highly adhere to the mandates of RA 7610 and DepEd Order No. 40, s. 2012; thus, implementation is in functional status, with strong partnerships with internal and external stakeholders. Child Protection Committees are capacitated to handle cases of child abuse. Child Protection Committees are functional, DepEd Orders are strictly observed, and coordination with LGUs and law enforcement is active. Reporting channels and the confidential documentation process are readily accessible. Although financial resources are available, additional funding is still needed to build spaces for counseling and related psychological services and to hire dedicated personnel to expand child protection initiatives. Collaboration and collective actions were evident, reinforcing the idea that child protection is a shared duty across important sectors.

Magsaysay Elementary Schools are highly compliant relative to the mandates of RA 7610 and DepEd Order No. 40, s. 2012. Schools consistently align their practices with the legal framework, ensuring that child protection

policies remain central to day-to-day operations. Stakeholders are regularly informed, thus making communication strategies effective in maintaining awareness and accountability. Schools actively implement early preventive measures to increase protection and ensure the safety and welfare of learners. Schools provide clear, easy-to-access, and reliable mechanisms for addressing child protection concerns. If the reporting process is clear, referral can happen. Schools provide appropriate interventions for affected learners. This highlights that compliance extends beyond prevention to include responsive care and recovery measures. A statistically significant relationship exists between implementation status and compliance level. The path coefficients and p-values show p-values below 0.05; the statistical decision leads to the partial rejection of the null hypothesis. The standardized estimates and p-value results confirm the rejection of the null hypothesis. This concludes that the Child Protection Committee members have a good knowledge of the provisions of RA 7610 and DepEd Order No. 40, s. 2012. The proposed action plan aligns implementation strategies with compliance requirements. It serves as a roadmap for Magsaysay Elementary Schools to strengthen awareness, enforcement, and reporting, and to guide stakeholder involvement in securing needed resources, thereby reinforcing a culture of child protection.

Recommendations - The following recommendations are proposed for implementation by the Schools Division Office (SDO), Office of the Public Schools District Supervisor, School Heads, and Child Protection Committee members. Schools may actively engage stakeholders under the whole-community approach and continuous improvement framework at the school and district levels to address emerging issues in child protection. DepEd Central Office and the schools may conduct the following: review and update D.O. No. 40, s. 2012 or the DepEd Child Protection Policy, integrate newly passed national laws relative to child protection to guarantee vertical and horizontal alignment and ensure that policy is responsive to current emerging needs in child protection; DepEd Central Office and Philippine Regulatory Commission (PRC) may impose capacity building on child protection as mandatory training for school personnel; Schools Division Offices and the schools may formalize partnerships with local partners through memoranda of agreements to ensure shared responsibility and increase accountability; DepEd may amend Section 18 of DepEd Order No. 40, s. 2012, adopting Section 7 of the Protection of Good Samaritan provision of R.A. 11930, otherwise known as Anti-Online Sexual Abuse or Exploitation of Children (OSAEC) and Anti-Child Sexual Abuse or Exploitation Materials (CSAEM) Act of 2022 to guarantee the anonymity of the informant in case reporting and DepEd policymakers are encouraged to amend existing guidelines to mandate 5% allocation of school MOOE specifically for child protection programs and allow of learner formation officers to perform child protection duties.

Sangguniang Bayan and Sangguniang Barangay may perform programmatic and governance oversight to ensure that child protection policy implementation practices in the lowest level of school governance remain aligned and compliant with the requirements of RA 7610 and other similar laws that governs child protection and DepEd Orders; DepEd may review the curriculum, and it is recommended that child protection concepts be integrated into the curriculum and be developed at an early stage of education to increase preventive and protection measures, and the Municipal LSWDO may provide capacity building on rehabilitation programs, specifically on disciplinary and diversion programs as stipulated in RA 9344 or the Juvenile Justice and Welfare Act of 2006, which include psychosocial support, reintegration activities, and collaboration with health and social welfare agencies to ensure holistic recovery for the victims and render restorative justice for the child-perpetrators. Given the significant relationship that confirms strong implementation drives effective compliance, it is recommended that DepEd transition its focus from issuing directives to providing structural support such as ICT infrastructures where all laws relative to child protection implementation are integrated into one system of operation that will allow digitized and real-time reporting and may further strengthen implementation of policy at the school level, shifting from basic awareness to functional, localized action. The proposed action plan may be adopted by the Local Government Unit of Magsaysay and be institutionalized across Magsaysay Elementary Schools. It is recommended that the plan be monitored annually through program implementation reviews and adjustments, including safety audit reviews. In conducting reviews, LGUs may adopt Section 44 of the Implementing Rules and Regulations of R.A. 11313, or the Safe Spaces Act of 2019, to ensure that legal mechanisms operate effectively and efficiently and that policies serve their intended purpose. It is recommended that future researchers conduct a

parallel study at a province-wide level to determine whether other municipal districts in this division have the same implementation status and compliance level as those in Magsaysay.

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Support systems and the experiences of learner athletes in San Jose National High School

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Abstract

This study examined the level of support systems and the experiences of learner athletes at San Jose National High School. Grounded in Role Strain Theory and Holistic Wellness Theory, it aimed to determine the level and effectiveness of support systems and the experiences of learner-athletes in terms of academic performance, mental well-being, and physical health. An exploratory sequential design was employed, in which qualitative data were gathered through interviews to inform the development of a validated survey questionnaire administered to 80 learner athletes. Findings reveal that learner-athletes experience significant challenges in academic performance, mental well-being, and physical health. These three interrelated areas reflect the strain of balancing the academic and athletic demands of learner-athletes. Moreover, learner-athletes perceive a high level of support systems in academic assistance, mental and emotional support, and physical support. However, the level of experiences in academic, mental, and physical domains also includes difficulties in time management, stress and anxiety, fatigue, and injuries. The results indicate that these support systems are not always sufficient to address the demands that learner-athletes face. Statistical analysis further showed that, while academic experiences were not significantly related to support systems, mental well-being and physical health were significantly associated with specific types of support systems. The study concludes that learner-athletes experience significant role strain, highlighting the need for more structured, integrated, and proactive support systems. Based on the findings, a comprehensive action plan, the ATHLETE Thrive, was proposed to strengthen support systems and enhance overall learner-athlete development.

Keywords: learner-athletes, support systems, academic performance, mental well-being, physical health

Support systems and the experiences of learner athletes in San Jose National High School

1. Introduction

Being a learner-athlete entails both privilege and responsibility, as it requires balancing academic requirements with training and competition. In the Philippine context, Republic Act No. 10676 and DepEd Order No. 052, s. In 2021, define learner-athletes as learners who represent their schools in athletic competitions while continuing their education. Their success and well-being largely depend on the support systems provided by teachers, coaches, and school administrators, who help them manage the demands of academic and athletic roles. However, this dual responsibility exposes learner-athletes to physical, mental, and academic challenges, especially when support systems are insufficient. Studies show that without adequate institutional support, learner-athletes may struggle to maintain academic performance and overall well-being. Navarro et al. (2017) found that academic advising, mentoring, and faculty support significantly help learner-athletes manage dual roles. Similarly, Comeaux & Harrison (2011) emphasized that academic assistance programs, such as tutoring and study halls, help them cope with demanding schedules. The National Collegiate Athletic Association (2022) further reported that collaboration among teachers, coaches, and counselors enhances academic engagement and motivation. In terms of mental health, a supportive school environment plays a crucial role in the development of learner-athletes. As stated by Lim & Ho (2022), a positive school climate contributes to better academic outcomes, while social support from peers, coaches, and teachers improves mental health and resilience, as stated by Graupensperger et al. (2020). However, the National Collegiate Athletic Association (2022) emphasized that not all schools have sufficient resources; thus, limited access to facilities, academic programs, and health services continues to challenge learner-athletes. Given these conditions, there is a need for a comprehensive school-based support program to address the physical, mental, emotional, and academic needs of learner-athletes (American Academy of Pediatrics, 2024). Thus, this study aimed to assess the level of support systems and the experiences of learner-athletes at San Jose National High School. The findings will serve as a basis for developing an action plan that promotes balance, well-being, and holistic development.

Statement of the Problem - This study examined the support provided by San Jose National High School to learner-athletes, focusing on their academic, mental, emotional, and physical aspects. It also investigated their experiences in balancing academic and athletic responsibilities and explored the relationship between school support and these experiences. The findings were intended to inform the development of a program to better assist learner-athletes in managing their dual roles. Specifically, this study aimed to answer the following questions: (1) What are the experiences of the learner-athletes in San Jose National High School? (2) What is the level of support systems for learner athletes in terms of academic assistance, mental and emotional support, and physical support? (3) What is the level of experience of the learner athletes in terms of academic performance, mental well-being, and physical health? (4) Is there a significant relationship between the level of support systems and the level of experiences of the learner athletes? (5) What action plan may be proposed to the school to enhance their learner athletes' support?

Significance of the Study - This study is significant to several stakeholders. For learner-athletes, the researcher believes that they will gain a deeper understanding of their shared experiences and the support systems that can enhance both their academic and athletic performance. For school heads, the findings may serve as a basis for planning and implementing effective school-based support system programs. Teachers may benefit from becoming more responsive and flexible in addressing the needs of these learners, particularly regarding academic support, time considerations, and instructional strategies. Teacher-coaches and trainers may gain insights that will help them adjust their instructional and coaching approaches to better support learner-athletes. Parents and guardians may become more aware of how to support their children's academic and athletic journeys in partnership with the

school. Moreover, the study may assist DepEd officials in coordinating programs, policies, and support services for teachers, coaches, trainers, and staff involved in the development of learner-athletes. The Local Government Unit of San Jose may also use the findings as a basis for more effective resource allocation and for identifying areas where support for learner athletes can be strengthened. Finally, this study may serve as a guide or reference for future researchers who intend to explore similar topics and conduct more in-depth investigations in this field.

Scope and Delimitation of the Study - This study focused on the support systems provided for learner athletes in terms of academic assistance, mental and emotional support, and physical support, as well as their experiences in relation to academic performance, mental well-being, and physical health. It aimed to examine how these support systems influence the overall experiences of learner-athletes within the school setting. The study involved 80 learner-athletes, aged 14 to 17 years, who represented the school at the Area Sports Meet for the School Year 2025–2026. These participants were selected as they directly experienced the demands of balancing academic responsibilities and athletic commitments. The findings of the study are limited to the selected respondents and the specific context of San Jose National High School. Thus, the results may not be generalized to learner-athletes from other schools or to those involved in different levels of competition. The scope of the study is further confined to the School Year 2025–2026, focusing on the support systems and experiences within this period.

2. Methodology

Research Design - The study employed an exploratory sequential design. It is an approach in which the researcher collects and analyses qualitative and quantitative data in a specific order, with each phase building on the results of the previous one (Creswell & Clark, 2017). The purpose is to gain a comprehensive understanding of the level of the available support systems and experiences of the learner athletes. In the first phase, qualitative data were collected through interviews with selected learner athletes to identify their experiences. The findings from this phase served as the basis for developing and refining a researcher-made questionnaire. In the second phase, quantitative data were collected via a survey administered to the officially recognized learner-athletes at San Jose National High School. The variables related to the experiences of learner athletes, particularly academic performance, mental well-being, and physical health, were derived from interviews conducted during the qualitative phase of the research. Readings and related literature informed the support systems for learner athletes, ensuring that the constructs were grounded in established research. These variables were then incorporated into the survey instrument and measured during this phase to determine the relationship between school support and learner athletes' experiences.

Respondents of the Study - The study was conducted at San Jose National High School, located in Bagong Sikat, San Jose, Occidental Mindoro. The school had a total population of approximately 4,000 students and accommodated about 80 learner-athletes aged 14 to 17 who actively represented the school in various sports at area meets. The researcher employed complete enumeration and asked them to assess the school's support systems and their experiences as learner-athletes.

Research Instrument - The first instrument used in this study was the interview guide. An interview was conducted with 15 randomly selected learner athletes from San Jose National High School. In the quantitative phase, a researcher-made questionnaire, based on findings from a review of related literature and existing tools on learner-athletes' well-being and support systems, was utilized. The first part of the questionnaire assessed the level of support systems for learner athletes, particularly academic assistance, mental and emotional support, and physical support. Responses were rated using a 4-point Likert scale: 4 – Strongly Agree, 3 – Agree, 2 – Disagree, and 1 – Strongly Disagree. The second part of the questionnaire assessed the extent of learner-athletes' experiences in academic performance, mental well-being, and physical health, using the same 4-point Likert scale.

To ensure the validity of the researcher-made instrument, a team of three graduate school professors from Divine Word College of San Jose brought their expertise and insights to ensure the clarity and appropriateness of the statements. The feedback and recommendations from the professors were incorporated into the questionnaire

draft to enhance its potential to generate valuable data for the research. A total of 30 respondents participated in the pilot testing phase of the instrument, and all responses were considered valid, with no data excluded. The 48-item research survey on learner athletes is divided into two main parts: (1) the level of support systems available to them and (2) the experiences encountered by learner athletes. The reliability of the research instrument was evaluated using Cronbach's alpha for standardized items to assess internal consistency. The six scales include academic assistance, mental and emotional support, and physical support for support systems, followed by academic performance, mental well-being, and physical health for learner-athletes' experiences. The table below summarizes the consistency across the different scales of support systems and experiences.

Table 1*Result of Reliability Analysis*

Scale (8 items each)	Number of Items	Reliability Coefficient*	Analysis
I. Level of Support Systems			
A. Academic Assistance	8	.803	High Reliability
B. Mental and Emotional Support	8	.841	High Reliability
C. Physical Support	8	.837	High Reliability
II. Experiences of the Learner Athletes			
A. Academic Performance	8	.905	Very High Reliability
B. Mental Well-being	8	.908	Very High Reliability
C. Physical Health	8	.898	High Reliability

*Based on Standardized Items

The experience scales showed higher internal consistency than the support scales. In fact, the mental well-being experiences scale achieved the highest reliability of .908, closely followed by .905. The three support-related scales produced very similar results, ranging from .803 to .841, indicating a high and stable level of reliability across the different types of support measured. The results from the reliability analysis demonstrated high internal consistency across all six scales, as coefficients exceeded the generally accepted threshold of .70. The overall results provide the necessary statistical justification to proceed to further inferential testing.

Data Gathering Procedure - The researcher complied with the Department of Education's requirements by securing approval from the Schools Division Superintendent. Permission was then obtained from the School Principal of San Jose National High School to conduct the study. Parental consent forms were also distributed and signed prior to data collection to ensure ethical compliance. With the necessary approvals in place, the researcher personally administered the survey questionnaires to respondents during their free time or after training sessions. The purpose of the study was clearly explained, and confidentiality was assured. After one week, the questionnaires were collected to ensure completeness of responses. The qualitative phase was conducted through personal interviews using the guide question: "What are your experiences as learner-athletes?" Selected learner-athletes, along with some coaches and teachers, participated in a discussion facilitated by the researcher to provide deeper insights into the support systems. The interview responses were analyzed using thematic analysis. Initial, developing, and final thematic maps were created to identify and refine the key themes emerging from the data. Finally, all collected data were organized, summarized, analyzed, and interpreted with the guidance of the research adviser and statistician.

Statistical Treatment of the Data - For qualitative data, the researcher employed thematic analysis to explore the variables. At the same time, the quantitative data addressed the descriptive problems and were processed using the statistical software SPSS version 26. For the inferential problems and the hypothesis, Partial Least Squares Structural Equation Modeling (PLS-SEM) was used, and results were generated using WarpPLS version 7.0. To describe the responses, frequencies and percentages were used. A 4-point Likert Scale was also employed. For the qualitative data, responses to interview questions were analysed using thematic analysis. The researchers carefully reviewed and organized the responses to identify common patterns, recurring ideas, and meaningful insights related to the experiences of learner-athletes. These responses were then grouped into themes that supported and enriched the quantitative findings, providing a deeper understanding of how support systems influence participants'

academic, mental, and physical experiences.

Ethical Considerations - The researcher acknowledged all the sources used as references in this study. The American Psychological Association (APA) citation was used to acknowledge the ideas of researchers and authors. This study aimed only to contribute to educational innovation and did not cause harm to anyone involved. The researcher asked permission from the school's division superintendent and the school principal of San Jose National High School to gather data for the study. The research instrument was also explained in detail to the learner-athletes. During the administration of the instrument, the survey questionnaire was distributed personally during their vacant time or after training hours. The confidentiality of the respondents' data was assured. It was guaranteed that all data and results gathered would be used exclusively for the study.

3. Results and Discussions

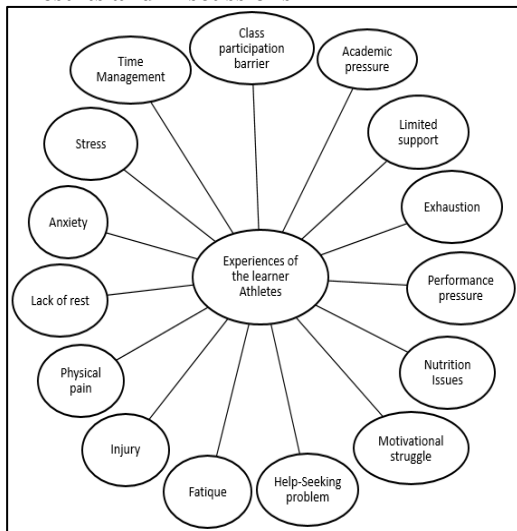


Figure 1. Initial Thematic Map of Experiences: of Learner Athletes

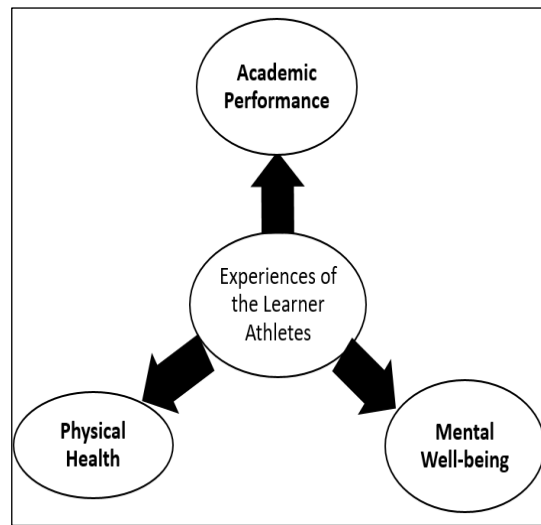


Figure 2. Final Thematic Map of Experiences of Learner Athletes

Figure 1 shows that, based on the interview, the respondents' challenges and difficulties were initially described using themes that emerged. Following the collection, transcription, coding, and extraction of responses, the themes were displayed in the thematic map. The fifteen (15) responses were time management, class participation, academic pressure, limited support, nutrition and health issues, lack of rest and recovery, injury and physical pain, fatigue and exhaustion, stress and anxiety, emotional burnout, motivational struggles, and help-seeking barriers. The final three themes in Figure 2 formed the foundation of the questionnaire, which covered academic performance, mental well-being, and physical health experiences. Learner-athletes who experience difficulties with time management, attending classes, and completing academic tasks tend to show lower academic performance due to the competing demands of training and school responsibilities. This is supported by Navarro et al. (2020) and Cuzzamu and Salcedo (2022), who explained that time constraints and rigid academic structures can lead to difficulties in completing schoolwork and maintaining performance. This supports the present study's theme of academic strain and adjustment. In addition, studies by Tenenbaum (2016) and Putukian (2016) emphasized that learner athletes are more vulnerable to stress, anxiety, and emotional exhaustion due to performance pressure and high expectations. Luo et al. (2025) further highlighted that social support plays a significant role in reducing psychological distress, reinforcing the mental and emotional pressures experienced by learner athletes.

Furthermore, Mountjoy (2018) and Fiedler et al. (2023) highlighted that fatigue, injuries, and inadequate recovery negatively affects both physical performance and overall functioning. Hamlin et al. (2021) also emphasized that a lack of rest increases the risk of injury and reduces concentration. These findings support the theme of physical health constraints in this research.

Table 2

Mean Level of Support Systems for Learner Athletes in Terms of Academic Assistance, Mental and Emotional Support and Physical Support

Academic Assistance	Weighted Mean	Interpretation
1. The school provides academic support, such as tutoring or study halls, for athletes.	2.70	High
2. Teachers provide consideration for missed classes or assignments due to training or competitions.	3.03	High
3. Guidance counsellors help learner-athletes manage their academic schedules.	2.94	High
4. Coaches encourage academic success alongside sports performance.	3.46	Very High
5. The adviser monitors the academic progress of learner athletes regularly.	3.33	Very High
6. The school provides flexible learning options, like make-up sessions for athletes during sports events.	2.88	High
7. There is open communication among teachers, coaches, and counselors to support learner athletes' academic needs.	3.16	High
8. The school provides guidance or orientation to help learner athletes balance their academic and athletic responsibilities.	3.11	High
Composite Mean	3.08	High
Mental and Emotional Support		
1. The school provides counseling or mental health services for athletes.	2.94	High
2. Teachers show concern for athletes' emotional well-being.	3.11	High
3. There are programs that promote stress management and emotional resilience.	2.69	High
4. Learner athletes feel comfortable seeking help when emotionally distressed.	2.79	High
5. The school fosters supportive relationships among teammates, coaches, and teachers.	3.13	High
6. The school provides awareness sessions that reduce stigma about mental health and encourage help-seeking.	3.09	High
7. Mentorship programs are available to help athletes manage stress.	2.90	High
8. The school recognizes and appreciates the efforts and achievements of student-athletes, which motivates them to continue both academically and athletically.	3.10	High
Composite Mean	2.97	High
Physical Support		
1. The school provides programs or activities that help improve the physical strength of learner athletes	3.36	High
2. Training sessions are conducted in safe and well-maintained areas.	3.44	High
3. There is access to medical or first-aid services during practices.	3.28	High
4. The school promotes proper rest and recovery for athletes.	3.08	High
5. Health monitoring and fitness programs are available for learner athletes.	3.13	High
6. The school ensures that sports equipment used by learner athletes is safe and properly maintained.	3.06	High
7. Qualified staff or trainers are available to guide athletes in injury prevention.	3.12	High
8. The school provides sufficient time and schedule for training without greatly affecting academic responsibilities.	3.15	High
Composite Mean	3.20	High
Overall Mean	3.08	High

Scale: 3.25-4.00 Very High; 2.50-3.24 High; 1.75-2.49 Moderate; 1.00-1.74 Low

Table 2 presents the mean levels of support systems for learner athletes across academic assistance, mental and emotional support, and physical support. The findings indicate that learner athletes perceive a high level of support, with a mean of 3.08. Physical support ranked highest (3.20), followed by academic assistance (3.08), while mental and emotional support received the lowest mean (2.97). Regarding physical support, the results show that learner athletes receive a high level of it. Among the three areas, this appears to be the most developed. Training sessions conducted in safe and well-maintained areas received the highest rating, suggesting that safety is a priority. Programs aimed at improving physical strength and access to medical services were also rated highly. These findings are consistent with Rosete et al. (2023), who emphasized the importance of safe facilities and proper equipment in enhancing performance and preventing injuries. Promotion of rest and recovery and equipment safety also received high ratings, though slightly lower than other indicators. This may suggest that while these areas are addressed, there is still room for improvement. Padua et al. (2018) emphasized that recovery and proper equipment are essential in reducing injury risks. These results reflect a strong physical support system, particularly in terms of safety and training conditions.

Second in rank is academic assistance; the results show that learner-athletes generally receive a high level of academic support from the school, as reflected in a composite mean of 3.08. This suggests that support mechanisms are in place and are being experienced by the students, although some areas appear stronger than others. Coach encouragement and adviser monitoring obtained the highest ratings. This may indicate that individuals who directly interact with learner-athletes play a significant role in shaping their academic behavior. When coaches emphasize the importance of academic performance, students may feel more responsible not only in sports but also in their studies. This supports the findings of Comeaux and Harrison (2011), who highlighted coaches' influence on academic motivation. Similarly, regular monitoring by advisers aligns with the observations of Grandy et al. (2016), who noted that structured guidance improves accountability and performance.

Lastly, regarding mental and emotional support received, the lowest mean (2.97) indicates that support is available across areas, though certain aspects may need further attention. Supportive relationships with teammates, coaches, and teachers received the highest rating. This highlights how daily interactions contribute to students' well-being. When learner athletes feel understood and supported, it becomes easier for them to manage both academic and athletic pressures. Similar observations were made by Luo et al. (2025) and Simons and Bird (2023), who emphasized the importance of social relationships in reducing stress. Teachers who showed concern for emotional well-being and recognized students' efforts also received high ratings. These results suggest that encouragement and acknowledgement play a role in sustaining motivation.

Meanwhile, counseling services and mental health awareness efforts indicate that schools are taking steps to address psychological needs. Cosh et al. (2024) noted that access to such services can help students cope with stress, even if not all choose to use them. Lower ratings were observed in stress management programs, comfort in seeking help, and mentorship programs. Although still interpreted as high, these may reflect students' hesitation to engage with available support fully. As pointed out by Cosh et al. (2024), stigma and fear of judgment can discourage help-seeking behavior. The above findings showed that while support systems are present, creating a more open and accepting environment may encourage greater participation and utilization.

This pattern may suggest that schools tend to prioritize visible, performance-related support, such as facilities and training, over psychological support. While all areas are rated positively, the lower score for mental and emotional support suggests it may require further strengthening. The results support the idea that a balanced approach is necessary. As noted by Stambulova et al. (2020), effective support systems should integrate academic, physical, and psychosocial dimensions.

Table 3 presents the learner-athletes' experiences regarding academic performance, mental well-being, and physical health. All indicators obtained composite means ranging from 2.72 to 2.76, with an overall mean of 2.74, interpreted as High. This means that learner-athletes regularly face considerable challenges in balancing school and sports. In terms of academic performance, the results show that learner-athletes often struggle with time management, meeting deadlines, and balancing training with academic requirements. This aligns with Navarro et al. (2020), who explained that learner-athletes often face academic difficulties due to overlapping schedules and limited study time. Cuzzamu and Salcedo (2022) also pointed out that rigid schedules and limited academic flexibility can further intensify these challenges. This suggests that academic pressure remains a major concern for learner-athletes. In terms of mental well-being, these findings indicate that learner athletes experience emotional strain, such as stress and anxiety. Tenenbaum (2016) noted that athletes often experience psychological pressure due to performance expectations and multiple responsibilities. While Putukian (2016) added that emotional exhaustion and burnout are common among learner athletes when coping mechanisms and support systems are limited. This highlights the continuing need for stronger mental health support in schools.

Table 3

Mean Level of Experiences of Learner Athletes in Terms of Academic Performance, Mental Well-being, and Physical Health

Academic Performance	Weighted Mean	Interpretation
I struggle to complete schoolwork due to training schedules.	2.90	High
I find it difficult to focus on lessons after training or games.	2.66	High
I often miss classes due to athletic commitments.	2.62	High
I find it difficult to maintain strong academic performance while participating in sports activities.	2.78	High
I have difficulty organizing my study schedule because of my sports training and competitions.	2.83	High
I sometimes fail to meet academic deadlines because of sports commitments.	2.69	High
I feel that limited access to academic assistance affects my school performance.	2.72	High
I sometimes feel overwhelmed by the combined demands of academic requirements and sports training.	2.86	High
Composite Mean	2.76	High
Mental Well-Being Experiences		
1. I feel stressed about balancing academics and sports.	2.59	High
2. I experience anxiety before or during competitions.	2.68	High
3. I sometimes feel emotionally exhausted or burned out.	2.76	High
4. I find it difficult to relax or take breaks because of my academic and athletic responsibilities.	2.73	High
5. I feel pressured to perform well in both academics and sports.	2.70	High
6. I hesitate to ask for emotional or mental support because of fear of judgment.	2.89	High
7. I lose motivation or focus when stress and anxiety become overwhelming.	2.61	High
8. I sometimes worry about not meeting the expectations of both my teachers and coaches.	2.89	High
Composite Mean	2.73	High
Physical Health Experiences		
1. I often feel fatigued due to training and school activities.	2.81	High
2. I experience muscle pain or injuries that affect my performance.	2.83	High
3. I have limited time for rest and recovery.	2.79	High
4. I experience sleep deprivation due to my schedule.	2.61	High
5. I find it difficult to maintain proper nutrition and physical fitness while balancing schoolwork and training.	2.54	High
6. I experience fatigue or overtraining that limits my classroom focus.	2.58	High
7. I sometimes experience illnesses or injuries that cause me to miss both training and classes.	2.79	High
8. Physical fatigue from training sometimes makes it difficult for me to actively participate in school activities.	2.80	High
Composite Mean	2.72	High
Overall Mean	2.74	High

Scale: 3.25-4.00 Very High; 2.50-3.24 High; 1.75-2.49 Moderate; 1.00-1.74 Low

Regarding physical health, the results suggest that learner-athletes frequently experience fatigue, injuries, and recovery issues. Mountjoy (2018) explained that intense training demands combined with insufficient recovery can negatively affect both physical condition and performance. Fiedler et al. (2023) also emphasized that physical strain and inadequate rest increase the risk of injury and exhaustion, which may also affect academic engagement. These notes show that learner-athletes consistently experience challenges in academic, mental, and physical areas. These findings align with related studies, which highlight the pressures of balancing dual roles. This underscores the importance of stronger school-based support systems that address academics, mental health, and physical well-being to help learner-athletes manage their responsibilities more effectively.

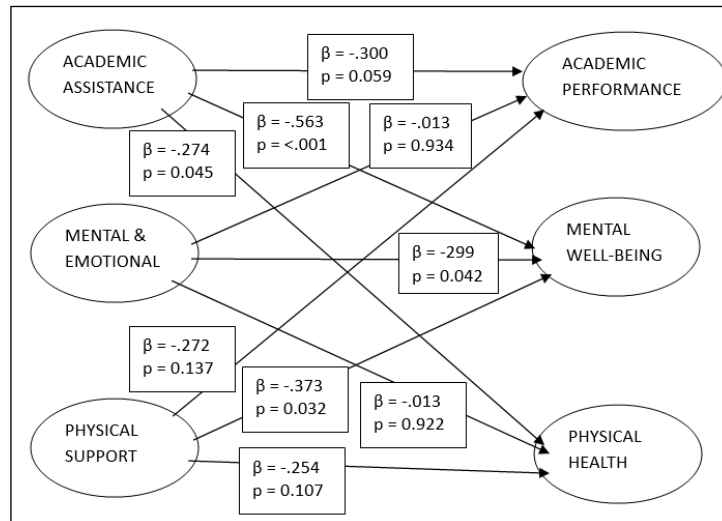


Figure 3. Structural Model of the Relationship Between the Level of Support Systems and the Learner Athletes' Experiences

Based on the structural model in Figure 3, the relationship between support systems and learner-athletes' experiences reveals several significant, albeit counterintuitive, connections. The most influential factor is Academic Assistance, which is a strong predictor of two outcomes: it has a highly significant negative impact on Mental Well-being and a significant negative impact on Physical Health. Interestingly, while it is close to the threshold, Academic Assistance does not reach statistical significance in its relationship with Academic Performance ($p = 0.059$). This finding may be explained by the literature indicating that learner-athletes often experience time constraints and competing academic and athletic demands, leading to stress and difficulty managing responsibilities (Watkins et al., 2022). Although academic assistance programs such as tutoring and advising are designed to support performance (Grandy et al., 2016), these are often provided when students are already struggling, thereby reflecting higher levels of academic strain that negatively affect their mental well-being and physical health.

In support of this, Cuzzamu and Salcedo (2022) argued that academic support does not always have a direct and significant effect on academic performance, as multiple factors, including time constraints, training demands, and personal behaviours, influence learner-athletes' outcomes. Their findings suggest that school-based support alone may be insufficient to improve academic outcomes, as other variables, such as after-school activities and student engagement, demonstrate stronger associations with performance. Furthermore, the presence of conflicting academic and athletic responsibilities may limit the effectiveness of support systems, indicating that academic performance is shaped by a complex interaction of factors rather than by academic assistance alone. Moreover, additional academic requirements may reduce time for rest and recovery, contributing to fatigue and health-related issues (Hamlin et al., 2021), which may also explain why its effect on academic performance is not statistically significant.

Subsequently, Mental and Emotional Support has a significant effect on Mental Well-being. This implies that learner athletes who receive better emotional support tend to handle stress and pressure more effectively. When support is limited, their mental well-being is more likely to be affected. This aligns with Luo et al. (2025), who found that social support helps reduce anxiety, stress, and depression among athletes. Mao (2025) also explained that psychological support improves coping and emotional regulation. Watson (2024) further stressed that mental health support is important because athletes are often exposed to high psychological demands.

Regarding Academic Performance, the relationship is not significant ($p = 0.934$). This suggests that emotional support alone does not directly improve grades or academic results. Mao (2025) explained that academic success

depends more on study habits, time management, and structured academic assistance. Ayala et al. (2024) also pointed out that cognitive and environmental factors play a bigger role in academic achievement than emotional support. The same result appears in Physical Health ($p = 0.922$), where no significant relationship was found. This means emotional support does not directly affect the physical condition of learner athletes. Pilkington et al. (2024) noted that physical health is more connected to training, recovery, and nutrition. Hu and Liu (2025) added that physical outcomes depend more on exercise behavior and self-efficacy.

The third, Physical Support, is a significant predictor of Mental Well-being. However, it unexpectedly shows no significant link to the athletes' Academic Performance ($p = 0.137$) and Physical Health ($p = 0.107$). This may be explained by the physical demands placed on learner athletes, as fatigue, injuries, and overtraining have been shown to affect academic engagement and performance negatively (Jones et al., 2017). While physical support, such as facilities, equipment, and medical services, is essential (Rosete et al., 2023; Mountjoy, 2018), its presence alone may not be sufficient to improve physical health outcomes, especially in contexts where recovery, workload management, and resources remain limited (Jaeger et al., 2023). Critically, every significant path in this model carries a negative beta coefficient. In the context of learner athletes, this suggests an inverse relationship where higher levels of reported support are associated with lower levels of well-being and performance. This often occurs in "reactive" support environments, where assistance is primarily scaled up when a learner athlete is already struggling, or it may indicate that the "support" variables are actually capturing the underlying demand or stress placed on the athlete rather than the effectiveness of the aid itself. This interpretation is consistent with the literature, which emphasizes that learner-athletes face interconnected academic, mental, and physical challenges (Stambulova, 2020) and that support systems are often implemented in response to these difficulties rather than as preventive measures. Therefore, higher levels of support systems may indicate greater underlying strain, which helps explain the consistently negative relationships observed in the model.

Table 4

Beta Coefficient of the Path and p-value for Ho₁

Path	Beta (β) Coefficient	p-value*	Interpretation
Ho: Level of Support Systems → Experiences of Learner Athletes			
ACADASST → ACADEXP	-0.300	0.059	Not Significant
MNTLSUPP → ACADEXP	-0.013	0.934	Not Significant
PHYSSUPP → ACADEXP	-0.272	0.137	Not Significant
ACADASST → MNTALWBE	-0.563	<.001	Highly Significant
MNTLSUPP → MNTALWBE	-0.299	0.042	Significant
PHYSSUPP → MNTALWBE	-0.373	0.032	Significant
ACADASST → PHYWBEXP	-0.274	0.045	Significant
MNTLSUPP → PHYWBEXP	-0.013	0.922	Not Significant
PHYSSUPP → PHYWBEXP	-0.254	0.107	Not Significant

*Significant at $p < .05$

Table 4 shows how academic assistance, mental and emotional support, and physical support influence academic performance, mental well-being, and physical health. None of the support variables significantly predicts academic performance. Although academic assistance ($\beta = -0.300$, $p = 0.059$) approaches significance, it does not meet the 0.05 threshold. Similarly, mental and emotional support ($\beta = -0.013$, $p = 0.934$) and physical support ($\beta = -0.272$, $p = 0.137$) show no statistically significant effects. This suggests that, within this model, these forms of support do not have a direct measurable impact on students' academic performance. This may be explained by the literature, which emphasizes that learner-athletes experience time constraints and competing academic and athletic demands, making it difficult to translate support into improved academic outcomes (Navarro et al., 2020). Although academic assistance programs such as tutoring and advising are designed to enhance performance (Grandy et al., 2016), their effectiveness may be limited when students are already under significant academic pressure and workload (Watkins et al., 2022), thereby weakening their direct impact on performance. All three forms of support significantly influence mental well-being. Academic assistance shows a strong, highly significant negative effect, indicating that it is the most influential predictor among the three. Mental and emotional support, as well as physical support, also have significant negative effects. These findings suggest that variations in these

support systems are meaningfully associated with students' mental well-being. This can be supported by studies indicating that learner athletes commonly experience stress, anxiety, and emotional exhaustion due to the dual demands of academics and sports (Tenenbaum, 2016). Support systems are often accessed when these psychological challenges are already present, particularly as mental health services are underutilized due to stigma and fear of judgment (Cosh et al., 2024). Additionally, academic pressure and physical strain further contribute to mental stress (Watson, 2017), explaining why higher levels of reported support are associated with lower levels of mental well-being. Academic assistance has a significant negative effect on physical health. However, mental and emotional support, as well as physical support, do not significantly predict physical health. This indicates that only academic assistance shows a measurable relationship with physical health in this model. This result may be explained by the literature, which highlights that academic demands can reduce time for rest and recovery, leading to fatigue and increased health risks among learner athletes (Hamlin et al., 2021). While physical support, such as facilities, equipment, and medical services, is essential (Rosete et al., 2023; Mountjoy, 2018), its effectiveness depends on adequate recovery, workload management, and resource availability, which may still be limited in some contexts (Jaeger et al., 2023). As such, the presence of support does not necessarily translate into improved physical health outcomes.

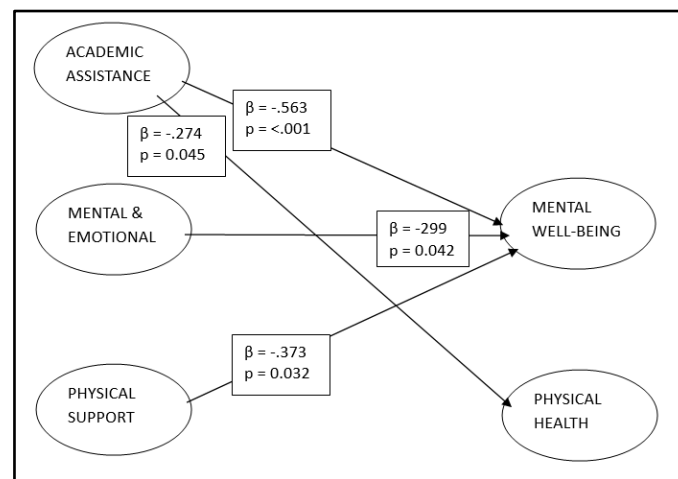


Figure 4. The Emerging Model

Figure 4 presents a streamlined version of the structural framework, in which Academic Assistance emerges as the most prominent variable, exerting a highly significant influence on Mental Well-being and a secondary, significant effect on Physical Health. Meanwhile, Mental & Emotional Support has a singular, significant impact on Mental Well-being, and Physical Support is the sole significant predictor of Academic Performance. The exclusion of non-significant paths simplifies the model and clarifies the specific "pressure points" within the support systems. However, the persistence of negative beta coefficients across all remaining pathways remains a defining characteristic of the model. This consistent inverse relationship suggests that as reported support increases, measures of well-being and performance tend to decrease. In practical terms, this may indicate that these support systems are primarily used by athletes already experiencing difficulties, suggesting a reactive rather than preventive support environment. This interpretation is supported by the literature, which indicates that learner-athletes face overlapping academic, mental, and physical demands that contribute to stress, fatigue, and performance challenges (Navarro et al., 2020). Academic assistance, while intended to support learners, is often accessed when academic strain and workload pressures are already high, which can negatively affect both mental well-being and physical health (Watkins et al., 2022; Hamlin et al., 2021). Similarly, mental and emotional support tends to be utilized when students are already experiencing psychological distress, such as anxiety and emotional exhaustion, and is further limited by stigma and barriers to help-seeking (Cosh et al., 2024; Tenenbaum, 2016). In terms of physical support, increased training demands, fatigue, and injury risk have been shown to interfere with academic engagement and performance (Jones et al., 2017), which may explain its negative association with academic performance. Moreover, the literature emphasizes that the effectiveness of support systems depends not

only on their availability but also on their quality, accessibility, and preventive nature (Mountjoy, 2018; Jaeger et al., 2023), yet these may still be insufficient to address the complex and interconnected challenges faced by learner athletes. By stripping away, the non-essential data, Figure 4 provides a clearer roadmap for understanding which specific interventions are currently linked to the athletes' lived experiences.

Table 5*Standardized Estimates of the Path in the Emerging Model*

Hypothesis	Standardised Estimates (β)	Standard Error	<i>p</i> -value*	Effect Coefficient* *	Effect Size
Ho: Level of School Support → Experiences of Learner-Athletes					
ACADASST→MNTALWBE	-.563	0.63442	<.001	.416	Large
MNTLSUPP→MNTALWBE	-.299	0.67946	0.042	.228	Medium
PHYSSUPP →MNTALWBE	-.373	0.67737	0.032	.240	Medium
ACADASST →PHYWBEXP	-.274	0.61266	0.045	.225	Medium

Table 5 shows how academic assistance, mental and emotional support, and physical support influence academic performance, mental well-being, and physical health. None of the support variables significantly predicts academic performance. Although academic assistance approaches significance, it does not meet the 0.05 threshold. Similarly, mental and emotional support, as well as physical support, show no statistically significant effects.

This suggests that, within this model, these forms of support do not have a direct measurable impact on students' academic performance. This finding may be explained by the literature, which emphasizes that academic performance among learner-athletes is influenced not only by support systems but also by time constraints, competing responsibilities, and rigid academic structures (Navarro et al., 2020). While academic assistance programs such as tutoring and advising are intended to improve performance (Grandy et al., 2016), their effectiveness may be limited when learners are already experiencing high levels of academic pressure and workload (Watkins et al., 2022), thereby reducing their direct impact on performance outcomes.

All three forms of support significantly influence mental well-being. Academic assistance shows a strong, highly significant negative effect ($\beta = -0.563$, $p < 0.001$), indicating that it is the most influential predictor among the three. Mental and emotional support ($\beta = -0.299$, $p = 0.042$) and physical support ($\beta = -0.373$, $p = 0.032$) also have significant negative effects. These findings suggest that variations in these support systems are meaningfully associated with students' mental well-being. This can be supported by studies indicating that learner athletes commonly experience stress, anxiety, and emotional exhaustion due to the dual demands of academics and sports (Tenenbaum, 2016). Support systems are often accessed when these psychological challenges are already present, particularly as mental health services are underutilized due to stigma and fear of judgment (Cosh et al., 2024). Additionally, academic demands and physical strain further contribute to mental stress (Watson, 2017), explaining why higher levels of reported support are associated with lower levels of mental well-being.

Academic assistance has a significant negative effect on physical health. However, mental and emotional support, as well as physical support, do not significantly predict physical health. This indicates that only academic assistance shows a measurable relationship with physical health in this model. This result may be explained by the literature, which highlights that academic demands can reduce time for rest and recovery, leading to fatigue and increased health risks among learner-athletes (Hamlin et al., 2021). While physical support, such as facilities, equipment, and medical services, is essential (Rosete et al., 2023; Mountjoy, 2018), its effectiveness depends on adequate recovery and on the availability of resources, which may still be limited in some contexts (Jaeger et al., 2023). As such, the presence of support does not necessarily translate into improved physical health outcomes.

Table 6

Proposed Action Plan to Enhance the Learner Athletes' Support Systems

ATHLETE (Athlete Total Health, Learning, and Training Enhancement) Thrive: Comprehensive Support Initiative for Learner Athletes' Academic, Mental, and Physical Well-Being						
Project Title	Objectives/ Targets	Strategies/ Activities	Time frame	Persons Involved	Budgetary Requirements	Expected Outputs
Strengthen Mental Health Support Programs (Improve emotional resilience and reduce stress, anxiety, and help-seeking barriers among learner athletes)		<ul style="list-style-type: none"> • Conduct quarterly Mental Health Awareness Campaigns (anti-stigma) • Organize monthly Group Counseling / Kumustahan sessions • Implement Peer Support Program ("Athlete Buddy System") • Integrate stress management workshops (mindfulness, time management) • Establish a confidential referral system to the Guidance Office 	Year-round (Quarterly & Monthly activities)	Guidance Counselor, School Head, Coaches, Advisers, Peer Facilitators	₱10,000.00 annually (materials, snacks, training kits)	<ul style="list-style-type: none"> • Increased help-seeking behavior • Reduced stigma on mental health • Improved emotional well-being and motivation • Established peer support system
Enhance Physical Health and Recovery Support (Reduce fatigue, injuries, and improve recovery practices of learner athletes)		<ul style="list-style-type: none"> • Schedule regulated training programs with rest days • Conduct quarterly medical check-ups / BMI monitoring • Provide basic first-aid kits and assign trained personnel during practices • Develop nutrition awareness sessions (low-cost, local food-based) • Create an improvised recovery area (rest corner) in the school 	Year round (Monthly monitoring; Quarterly check-ups)	MAPEH Teachers, School Nurse (if available), Coaches, LGU Health Workers, Parents	₱15,000.00 (first-aid kits, basic equipment)	<ul style="list-style-type: none"> • Reduced injury incidence • Improved physical fitness and endurance • Increased awareness of nutrition and recovery • Safer training environment
Optimize Academic Assistance Integration (Improve academic performance and reduce missed requirements among learner athletes)		<ul style="list-style-type: none"> • Establish "Athlete Study Hall" after training (2–3x/week) • Implement Peer Tutoring Program (honor students assisting athletes) • Provide flexible deadlines and make-up classes • Monthly academic monitoring (progress tracking sheets) • Conduct orientation on time management and study skills 	Year-round (Weekly & Monthly activities)	Subject Teachers, Advisers, Coaches, Academic Coordinators	₱5,000. 00 for materials (printing)	<ul style="list-style-type: none"> • Improved grades and completion rates • Reduced academic stress • Better time management skills • Strengthened teacher-coach coordination
Holistic Monitoring and Evaluation Framework (Establish a sustainable system for tracking learner athletes' academic, mental, and physical well-being)		<ul style="list-style-type: none"> • Develop Student-Athlete Monitoring Tool (Academic, Mental, Physical indicators) • Conduct quarterly evaluation meetings (Teachers-Coaches-Guidance) • Maintain individual athlete profile records • Administer bi-annual feedback surveys • Prepare annual ATHLETE Thrive report for school improvement planning 	Quarterly & Annually	School Head, Research Coordinator, Guidance Counselor, Coaches, Advisers	₱3,000. 00 (printing, documentation)	<ul style="list-style-type: none"> • Functional monitoring system • Data-driven decision-making • Improved coordination among stakeholders • Annual evaluation report

The ATHLETE Thrive Program (Athlete Total Health, Learning, and Training Enhancement) is designed as a practical support system that responds to the real needs of learner athletes. It focuses on three key areas academic performance, mental well-being, and physical health, while ensuring that these are continuously monitored. This approach reflects findings that learner-athletes perform better when support is integrated, rather than provided in isolation, across different aspects of their lives (Stambulova et al., 2020). To begin with, the program strengthens mental health support by promoting a more open and supportive school environment. It includes activities such as

awareness campaigns, counseling sessions, peer support groups, and stress management workshops to help student-athletes feel more comfortable seeking help. Since many athletes hesitate to open up due to fear of judgment, making support more visible and approachable is essential. Research shows that when schools actively promote mental health services, students are more likely to cope effectively with stress and pressure (Gulliver et al., 2017). At the same time, the program gives importance to physical health and recovery. Regular health check-ups, basic medical support, nutritional guidance, and designated rest areas help ensure that learner-athletes are physically prepared for both academic and athletic demands. When students are physically well, they become more focused, energetic, and better able to handle daily responsibilities. Studies show that proper recovery and physical care help reduce fatigue and injuries, which are common concerns among athletes (Mountjoy et al., 2018). Academic support is also strengthened through simple but consistent strategies such as study halls after training, peer tutoring, flexible deadlines, and regular monitoring of academic progress. These interventions help student-athletes manage their time better despite their demanding schedules. With proper structure and guidance, they are more likely to maintain academic performance. Research confirms that structured academic support plays a key role in helping learner athletes balance their dual responsibilities (Capranica et al., 2019).

Lastly, the program includes a monitoring system to track learner athletes' progress across all three areas. Regular meetings, feedback sessions, and documentation allow teachers, coaches, and school heads to respond early when issues arise. This ensures that support is not only provided when needed but is also continuous and adaptive. Studies highlight that consistent monitoring strengthens the effectiveness of school-based interventions (Stambulova et al., 2020). To end with, the ATHLETE Thrive Program is not simply a set of activities but a continuous support system that helps learner athletes develop in a balanced and sustainable way. By making support more accessible, consistent, and connected, the program enables them to manage both academic and athletic demands with greater stability and confidence.

4. Conclusions

Based on the summary of the findings, several conclusions were drawn. Learner-athletes experience significant challenges in academic performance, mental well-being, and physical health, reflecting the strain of balancing academic and athletic demands. In terms of academic performance, learner-athletes often feel overwhelmed by the demands of managing their academic responsibilities alongside their athletic roles. With regard to mental well-being, they experience stress and emotional strain in handling dual roles, and these concerns are frequently underreported due to stigma, indicating a gap between the availability and actual utilization of support services. In terms of physical health, learner athletes face physical strain, including fatigue, injuries, and inadequate recovery, which negatively affect both their academic and athletic performance, highlighting the need for proper recovery and health monitoring.

Furthermore, the level of school support for learner athletes varies in effectiveness. Academic assistance generally helps meet their academic demands; however, it tends to be reactive rather than planned, suggesting the need for better coordination and evaluation. Mental and emotional support services are present but are often provided only when problems arise, emphasizing the need for more preventive and structured approaches. Physical support systems contribute to the health and performance of learner athletes, yet these services require greater consistency and systematic monitoring. Overall, the findings reveal that support is often provided only after difficulties have already emerged, rather than helping learner-athletes prevent them. This underscores the importance of strengthening support systems to be more proactive and responsive to the needs of learner athletes, not only during times of struggle but also throughout their academic and athletic journeys. Consequently, the proposed action plan adopts a holistic approach that addresses the academic, mental, and physical needs of learner athletes. It aims to improve academic performance, enhance well-being, and promote balance between school and sports, while also addressing gaps in existing support systems and the persistent challenges they face, ultimately transforming these systems into more responsive, learner-centered mechanisms.

Recommendations - Based on the study's conclusions, several recommendations are proposed. The school

may implement an integrated support system that combines academic assistance, mental health services, and physical wellness programs. The ATHLETE Thrive Plan may be institutionalized as a regular school program to ensure continuous support for learner-athletes. Coordination among teachers, coaches, and parents may be strengthened to provide consistent guidance. At the same time, orientation and training on time management, goal setting, and work-life balance may also be conducted to help learner-athletes manage their dual roles effectively. Regarding learner-athletes' level of experience, the school may provide structured academic support, such as study halls and peer tutoring, aligned with training schedules. Flexible academic arrangements, including make-up classes, adjusted deadlines, and modular options during competitions, may also be implemented, along with regular academic monitoring through close coordination among advisers and subject teachers. To support mental well-being, the school may strengthen mental health support by offering regular counseling, stress management sessions, and resilience training. Awareness campaigns may be conducted to reduce stigma and encourage help-seeking, while peer mentoring programs may be established and guidance services made more accessible and visible. For physical health, the school may implement proper training and recovery programs with adequate rest schedules to prevent overtraining. Health monitoring, first-aid services, and coordination with local health units may be enhanced, alongside nutrition education and proper maintenance of sports facilities and equipment.

Regarding the level of support systems for learner-athletes, the school may improve tutoring programs and ensure their accessibility, while also increasing resources and funding for academic support initiatives. Counselling services may be expanded and made more responsive, with stronger coordination among teachers, coaches, and parents to support learner-athletes' emotional well-being. In terms of physical support, the school may strengthen health services, ensure immediate access to care, and improve collaboration among school personnel to support physical health and recovery. Furthermore, the school may adopt a more proactive and data-driven support system in which academic interventions address learning difficulties at an early stage, and mental and physical health programs focus on prevention rather than reaction. Strengthened collaboration among teachers, coaches, and guidance staff is essential, as is the use of monitoring systems to identify at-risk learner-athletes and provide timely interventions. Finally, the ATHLETE Thrive Plan may be fully implemented and institutionalized to provide holistic support. Continuous monitoring and evaluation may be conducted to assess its effectiveness, guide improvements, and ensure its integration into the School Improvement Plan (SIP) and Annual Implementation Plan (AIP). Partnerships with local government units, non-government organizations, and other stakeholders may also be strengthened to support resources and services, and future research may be encouraged to assess long-term outcomes and identify additional influencing factors.

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